The RUBBER AGE

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LATE NEWS of the Industry

Kelly-Springfield Receivership Suit Is Dismissed in New Jersey Court

RECEIVERSHIP proceedings brought against the Kelly-Springfield Tire Company on September 5 by James A. Kelly, Jersey City real estate operator, were dismissed by Vice-Chancellor John J. Fallon of the New Jersey Chancery Court on September 17. The petition was dismissed at the request of Mr. Kelly's own attorney, who withdrew from the case, stating he was led to believe the action "was not instituted in all sincerity," but that "there was a possibility that other people were interested in stock manipulations."

Mr. Kelly, who, according to affidavits presented, was not a stockholder of record on the day when he filed the suit, claimed that the company had lost more than $7,000,000 in the last seven years, had paid no dividends since 1921, owed back dividends on the preferred stock, and showed "no prospects of recovery." An affidavit submitted by Samuel Woolner, Jr., president of the company, showed that on July 31 there were current assets of $13,000,000 and current liabilities of $2,100,000 and that net profit for July and August was approximately $270,000.

The Kelly-Springfield Tire Company, which has been established since 1899, was represented by former Federal Court Judge Thomas G. Haight in the proceedings.

A petition for a receiver was also filed in Federal Court at Newark, N. J., by Conrad J. Levin, of New York City, on the basis that the company has liabilities of $33,000,000 and assets of $20,000,000. Federal Judge Guy Fake on September 18 dismissed the suit upon motion made by Mr. Haight.

July Tire Output Smallest for Year; Stocks Lowest Since November, 1928

INVENTORIES of pneumatic casings on hand July 31st were at the lowest levels since November 30, 1928, according to statistics issued by The Rubber Manufacturers Association, Inc. This organization reports 12,599,091 casings on hand July 31st, a decrease of 11% under June 30th of this year and 21% below July 31st a year ago.

Shipments of pneumatic casings for the month of July amounted to 5,810,448 and represents an increase of 2.9% over June, although 26% under July, 1929, and 26.4% under July, 1928. Production of pneumatic casings for the month of July is placed at 5,257,409, a decrease of 22% under June; 34% under July a year ago and 34.5% below July, 1928. Balloon casing output was the lowest thus far in 1930, while high pressure casing production was probably the lowest for a decade.

Production of pneumatic casings for the first seven months of 1930 exceeded shipments by less than one half of one per cent as compared with a 6% excess the same period a year ago and a 3% excess in 1928. Shipments of pneumatic casings for the first seven months of 1930 were 24% below the same period in 1929 and 16% under 1928.

July inner tube production was also the lowest for the year and, with shipments the highest in ten months, inventories were brought down to the lowest point since 1925. The same situation was apparent in the case of solid and cushion tires, production and inventories being the smallest in years.

The tire industry is estimated to have consumed 52,486,996 pounds of crude rubber and 17,865,852 pounds of cotton fabric during the month of July in the manufacture of all types of pneumatic casings, tubes and solid and cushion tires.

The association's estimates are based on reports furnished by manufacturers who produce approximately 75% of the total for the United States, but have been adjusted to represent 100% in the above figures.

United States Rubber Consumption Totaled 30,575 Tons During August

CONSUMPTION of crude rubber by manufacturers in the United States for the month of August is estimated at 30,575 long tons by the Rubber Manufacturers Association in its monthly statistical compilation. issued today. This is an increase of 4.6 per cent over the July consumption of 29,245 long tons and compares with 38,274 long tons in August, 1929, and 42,927 long tons in August, 1928. Seven months' consumption, based on the association's first two quarterly reports and the July and August monthly figures, was 273,522 long tons, as against 276,076 long tons in the same period last year.

Imports of crude rubber into the United States during the month of August totaled 34,558 long tons, according

to the association's estimates, as compared with its own figures of 34,084 long tons in July; 38,292 long tons in August, 1929, and 29,805 long tons in August, 1928.

The association estimates total domestic stocks of crude rubber on hand and in transit overland August 31st at 158,178 long tons as compared with 152,001 long tons as of July 31st and 90,769 long tons as of August 31st, 1929. Crude rubber afloat for United States ports is estimated at 61,168 long tons as against 58,326 long tons on July 31st and 49,423 long tons the same date a year ago.

Michelin Abandons New Jersey Factory; Finds Price-Cutting Ruining Industry

AFTER 23 years of operation, the plant of the Michelin Tire Company at Milltown, N. J., has been closed permanently and will be offered for sale. This announcement was made on September 10 by J. Hauvette Michelin, vice-president of the company, together with an explanatory statement condemning present merchandising conditions in the tire business.

The Milltown factory was closed down on April 24, but

The factory of the Michelin Tire Company at Milltown, N. J.

previous company statements had been to the effect that it would be reopened as soon as business improved. Its permanent abandonment marks the end of a model industrial community, established in 1907, including 350 workers' homes and providing employment for about 2,000. Some 700 of these former employes will share in approximately $700,000 of bonus money that was originally set aside as a trust fund to be given the workers three years after completing their contracts with the company.

Recent slack business is quite frankly the underlying cause of the closing, according to the explanation by M. Michelin, but it is the manner in which the industry generally has attempted to cope with bad business and the unsound economics which he says have controlled the merchandising of tires during the past year that he criticizes most bitterly. Such conditions, the company found, "made it impossible to run our plant with any chance of breaking even," causing the original shut-down last April.

"Since that time," M. Michelin states, "the stock of tires and tubes on hand has been sold and company officials have made a study of conditions in the tire and merchandise end. The result of the study has brought about the decision to abandon thoughts of reopening the plant for manufacturing Michelin tires.

"We found the price is very decidedly now the most important factor in closing any sale. The quality seems to have been lost sight of for the time being in the struggle of manufacturers to, notwithstanding the declining demand, increase their volume by reducing prices to the point where there is no profit for the manufacturer and no profit for the retailer, either.

"Independent tire dealers are dropping out fast, while the fight for volume in tire sales goes on between the chain stores and the oil stations on one side and the factories-controlled retailers on the other."

The industry generally operated at a loss during the first six months of this year, M. Michelin added. While depreciation in the market value of cotton and rubber was generally given as the reason, he said that actually the major cause was selling at a loss, and that manufacturers were multiplying the number of their brands and grades in an uneconomic effort to bolster up a falling market demand.

The Michelin Tire Company was a subsidiary of the firm of Michelin et Compagnie, whose main plant is at Clermont-Ferrand, France. The original factory was established in 1832, and the company has a branch plant at Stoke-on-Trent, England, and another at Turin, Italy, which it is reported as being about to sell to the Pirelli Rubber Company. Plans are also being made for a new factory in Argentina.

Oil Companies Follow Standard of N. J. In Adding Lines of Automobile Tires

SINCE the announcement by the Standard Oil Company of New Jersey that it would sell tires and tubes at its own gasoline stations, other oil companies are planning to pursue the same policy. Some will stock recognized brands of nationally known rubber manufacturers, while others will carry private brands such as the Atlas tires and tubes now being merchandised by the New Jersey Standard organization.

Among these firms is the White Star Refining Company, Detroit, Mich., which will sell its own brand, Staroline, named for the company's premium gasoline and motor oils. The Pocahontas Oil Corporation, Cleveland, O., is beginning the sale of the Pharis tires, made by the Pharis Tire & Rubber Company of Newark, O. Tri-State Refining Company of Ashland, Ky., is selling Fisks. C. A. Pierce Oil Company, Akron, O., handles Seiberlings; Allegheny-Arrow Oil Company, Wooster, O., Firestones. In the middle west one finds almost every standard brand handled by some oil company. Among successful tire merchandisers in Kansas are the Kent Oil Company and Lesh Oil Company.

Commenting on the situation, *The National Petroleum News* has published the following statement: "Opinion varies among tire manufacturers as to whether oil companies make good tire merchants. Firestone has favored the Firestone company controlled dealer or company owned outlet. Firestone now controls through majority ownership between 300 and 400 super-service stations in the United States.

"Goodrich is perhaps the second largest owner of company-controlled super-service station outlets. Yet Goodrich, one is told in Akron, looks with favor on oil company distribution for its tires and tubes.

"The Standard Oil Company set aside a tire department in its first super-service station in Ohio. The department was operated by Goodrich. The petroleum business—gasoline, oil and greasing—prospered, but the tire end lagged. Finally the tire department was dismantled and the space used for more greasing facilities and a specialty oil display room.

"Pocahontas is doing what oil companies that have not succeeded as tire merchants failed to do: they are hiring a tire man to supervise the tire department.

"Batteries may be next, for a battery business supplements a tire business. The chief tire trade comes in summer and the battery trade in winter. The price situation in each line, though low, seems to promise additional profits if operated on a sound basis."

Firestone and Seiberling Cut Salaries; Others Refuse to Follow Goodyear Lead

FOLLOWING the example set by the Goodyear Tire & Rubber Company earlier this month, the Firestone Tire & Rubber Company and the Seiberling Rubber Company have announced salary reductions of 10 per cent.

There was no comment forthcoming from officials of either concern excepting a brief statement attributing the cut to a policy of retrenchment intended to enable the company to avoid discharging hundreds of employes.

C. W. Seiberling, vice-president of the Seiberling Rubber Company said that the salary reduction in some instances was greater than 10 per cent, but declared that there was no immediate prospect of reducing the number of employes in the plant.

The cut in the Firestone salary payroll, similar to the policy established by Goodyear, will affect all office and salespeople. Several weeks ago, all higher salaried employees of the Firestone organization, receiving $3,000 or more, were cut 10 per cent.

Other rubber manufacturing organizations, however, have refused to follow the lead set by Goodyear. B. F. Goodrich Company officials stated recently that their concern was committed to a policy for September that would not make necessary announcement of any salary reduction or decrease in the number of employes in office or plant.

R. S. Shainwald, president of the Paraffine Companies, Inc., San Francisco, Cal., declared in a recent statement: "The Paraffine Companies, Ltd., has made no reductions in personnel of its manufacturing, sales or office organization, nor has it made any wage cuts before or since the depression beginning last fall. It believes such reductions can and should be avoided." The Paraffine Companies, which two years ago, acquired the Plant Rubber & Asbestos Company, has reported for the year ended June 30, 1930, a net profit of $2,556,041 as against $2,863,258 in the preceding year.

Giant Tire & Rubber Company Acquired By Master Tire & Rubber Corporation

AFTER extended negotiations, a controlling interest in the Giant Tire & Rubber Company, Findlay, O., has been acquired by the Master Tire & Rubber Corporation, a holding and managing company which already controls the Cooper Corporation, also of Findlay, and the Falls Rubber Company, Cuyahoga Falls, O. Manufacturing activities of both the Cooper and the Giant companies will be combined in the Cooper plant.

Control of the Giant company was secured through an exchange of securities between the Master Tire & Rubber Corporation and the Giant majority stockholders. Combining the manufacture of Cooper and Giant Hartcraft tires and tubes in one factory is expected to result in material reduction of overhead and the saving of many duplications in both factory and office.

The Giant Tire & Rubber Company was organized in Akron in 1916 and moved to Findlay in 1917. The company was reorganized in 1921 at which time it started the manufacture of the present line of Giant tires. In addition to the Hartcraft De Luxe and Giant tires and tubes sold through distributors and dealers, the Giant company makes a number of private brands for large operators in the chain store and automobile accessory fields. It recently contracted to produce tires and tubes for the Lincoln Oil Refining Company, a subsidiary of the Ohio Oil Company, to be sold through gas stations under the "Linco" brand.

The officers of the Master Tire & Rubber Corporation are I. J. Cooper, president; Frank C. Millhoff and John F. Schaefer, vice-presidents; H. P. Bremer, secretary; and William P. Cline, treasurer. C. E. Hart has been president and D. E. Reynolds vice-president of the Giant Tire & Rubber Company since its inception. Mr. Shaefer was one of the founders of the Giant firm.

Goodyear Tire & Rubber Company Sells Its Business in Rubber Tire Chains

THE Goodyear Tire & Rubber Company announced this month the sale of its line of rubber tire chains to the United States Chain & Forging Company, which will make it an addition to its McKay line of tire chains. In its new ownership it will be known as the McKay rubber tire chain and it will retain all of the advantages and features as when made by Goodyear. Under the terms of the sale, all of the equipment used in the manufacture by Goodyear is taken over by United States Chain & Forging as well as all stocks of chains and cross links.

In announcing the sale, M. K. Moore, manager of accessories sales of Goodyear, paid tribute to the United States Chain organization, terming it a fine big concern in wonderful position to handle dealers' chain requirements through more than 400 already existing jobbers and its own distribution points. It will fill immediate orders with Goodyear rubber chains, he said, and later on will have its own McKay rubber chain. There will be no change in prices or terms, including dating, Mr. Moore said.

As reason for the sale, Mr. Moore pointed out that Goodyear has experienced difficulty in maintaining sufficient stock in the proper sizes and at the proper points to handle business when it arose. Being a highly seasonal article, he said, the dealer's, as well as Goodyear's, success and profit was dependent on being able to promptly and properly give service.

"For this reason," he said, "we have felt for some time it would be a great thing if some responsible steel chain manufacturer would merchandise both steel and rubber chains. Being specialists, concentrating their efforts and having long experience in the selling and distribution of this commodity, their entire set-up would make it possible to do the thing we have desired."

L. A. Gerber, general sales manager of United States Chain & Forging, expressed the pleasure of his company in acquiring from Goodyear the rubber chain business. For three years, he said, the company had watched the sales trend of the rubber tire chain and had seen it establish a firm hold and a growing demand in the tire chain market.

Fisk Increases Production Schedule; Report of Assets Indicates Decline

THE Fisk Rubber Company, Chicopee Falls, Mass., on September 15 increased its production schedule to five days a week from four, the change affecting 1,700 employes. The four-day schedule has been in effect several months.

A statement of the Fisk Rubber Company and its subsidiaries as of June 30, 1930, shows total assets of $57,259,525, comparing with $63,414,135 on June 30, 1929, and profit and loss deficit of $8,717,615 against surplus of $1,193,952. Current assets on June 30 this year amounted to $21,617,586 and current liabilities $1,952,861, comparing with $34,861,495 and $5,455,055, respectively, on June 30 of last year.

In addition to current liabilities, however, there are $8,199,500 5½ per cent notes falling due on January 1 next. The statement further shows cash on June 30 at $1,322,453 as compared to $3,788,743 a year previous. The reserve set aside for contingencies, etc., was at $855,589 on June 30 this year as against $1,589,003 at the same time in 1929.

(Other news of the industry will be found on Pages 655-661)

The FOREIGN PRODUCTION

About Twenty-Eight Nations Are Producing Mechanical Rs— Canada as Chief Competitors—Industry Co ow

By HA AN
Rubber Division, Unite ent

HISTORY and theory of economics disclose that nations pass through three stages of evolution—the pastoral, the agricultural, and the industrial. Peculiarly as it may seem in this day of rapid progress and advancement, several nations are still listed as pastoral, many as agricultural, and only a few as strictly industrial.

With the transition of each State from one stage to another comes a desire for the production of goods necessary to life and comfort. First, this desire is accomplished by hand methods, then comes the inclination for a larger production through the use of machinery and various devices. And with the latter comes the demand for technical appliances and accessories. Included among these appliances are mechanical rubber goods. Transmission belting makes the wheels of industry go round. Then there is conveyor belting with its peculiar uses, followed by rubber hose and rubber packing. In addition to these major items, comprising the class known as mechanical rubber goods, are many other rubber technical manufactures among which may be mentioned valves, vents, washers, separators, pipes, caps, fittings, discs, and the like—all playing a part in the movement of machinery and the ultimate production of goods.

Demand is Increasing Yearly

Every country is desirous of some day being classed as a great manufacturing nation. It seems to be the ambition of even the smallest of States, consequently the demand for mechanical rubber goods will continue to grow and as the nations develop their industrial power, a greater need for mechanical rubber goods to be supplied by the major rubber-manufacturing countries will be apparent.

From the above theory, and from the annual statistics of the producing nations, it is conclusive that the consumption of mechanical rubber goods is not decreasing,—in fact, the increase in recent years has been somewhat phenomenal. With the erection of every new modern factory comes an order for a large volume of mechanical rubber goods, whereas the older established factories are required constantly to replace their worn-out equipment.

Rubber Belting and Other Mechanical Rubber Goods at the Peugrot Automobile Works, France

Many Nations Produce Mechanical Rubber Goods

At least 25 countries today produce mechanical rubber goods, but only in about 10 is the industry of any great importance, and even less than that number compete seriously in international trade. Of the latter group, the United States, the United Kingdom, Germany, and Canada head the list. France, one of the principal rubber-manufacturing countries, seems to be less independent in this category of rubber manufacture than others, although considerable quantities of mechanical rubber goods are produced and exported annually.

Other more or less producing and exporting countries are Norway, Czechoslovakia, Belgium, Italy, Austria, and Japan. Then there is another group where production has reached an important stage, but the activity of the local industries is concerned solely with supplying the local demand. Some of the countries in this group are the Union of South Africa, Australia, Soviet Russia, Sweden, Denmark, the Netherlands, Poland, Spain, and Hungary.

United States Principal Producer and Exporter

The manufacture of mechanical rubber goods had its early growth in the United Kingdom, but its major sphere of importance shifted to the United States which now leads the world in production and exportation. The United States now produces annually mechanical rubber goods in excess of a value of $100,000,000 and exports a value of more than $8,000,000. From these figures it can be seen that a large percentage of the domestic production is consumed locally.

Britain Industry Well Developed

The industry within the United Kingdom is well developed and the nation is practically capable of manufacturing and supplying the requirements of the Kingdom. The free trade policy of the country, however, makes that nation a principal outlet for other producing countries and at the same time an important competitor in international trade.

The principal centers of manufacture are in the London, Manchester, and Birmingham areas. The industry is practically headed by the Leyland & Birmingham Rubber Company with the principal offices at Leyland in Lancashire, but maintaining other plants at Glasgow, Mitcham, and Preston. The ordinary paid-up capital is reported as £600,000. About 3,000 are employed.

Other principal factories are India Rubber, Gutta Per-

N ECHANICAL RUBBER GOODS

cal R s—United States Leads With Germany, United Kingdom and Co ow Great Increase in Output Yearly

y HARMAN
Unite ent of Commerce

cha & Telegraph Works, Midland, Mosely, North British, Pirelli, and Goodyear. The manufacture of mechanical rubber goods by the comparatively recent subsidiary of the latter American company has consequently strengthened the British industry.

It is difficult to arrive at any definite or exact figures regarding the production and consumption of mechanical rubber goods in the United Kingdom. It is estimated, however, that the value of production now exceeds £3,365,000 while the consumption is in the neighborhood of £2,842,000. The local industry supplies approximately 95 per cent of the consumption of hose, piping, and tubing, but only about 63 per cent of the rubber belting.

Rapid Progress Made by Germany

Being highly developed industrially and using a very great proportion of modern power machinery, Germany is probably one of the greatest consumers of mechanical rubber goods. Besides, the mechanical rubber goods industry has shown remarkable progress, especially in rubber hose. Germany is at the present time the second largest producer and exporter of rubber hose in the world, all of which has been acquired within the past few years.

Most of the finished product is manufactured in north and south Germany, and the Rhineland. Berlin, Hamburg, Frankfort and Cologne are the most prominent distributing centers. Continental Caoutchouc & Gutta Percha Company, of Hanover, with its several other controlling factories is the most potential producer.

Canada An Important Producer

Canada, rapidly reducing the lead of the parent country as an exporter of rubber products, is now an important manufacturer, consumer, and exporter of mechanical rubber goods. The value of the production for 1928, the latest available year, was around $5,453,900 — an increase over the previous year.

The principal Canadian manufacturers are Dominion, Goodyear, Firestone, and Goodrich, all of which are subsidiaries of United States companies. Although Canada is looked upon as an important world supplier for belting, hose, and other mechanical rubber goods, the local industry is not developed so extensively as to insure complete self-sufficiency. The United States still sends considerable quantities of mechanical rubber goods to Canada, in fact after the United Kingdom, Canada is our best outlet.

Production Comparatively Large in Czechoslovakia

Czechoslovakia, which inherited the major portion of the rubber industry of the former Austro-Hungarian Empire, has a comparatively large production of mechanical rubber goods. At present such goods are produced by six important concerns, namely Semperit, Matador, Kudrnac, Optimit, Veritas, and Hacknauf.

Up until the first of 1930, the foregoing companies were united in a cartel through which prices were stabilized. Because some of the members broke their agreement, the cartel was liquidated and since then the two strongest firms —Semperit and Kudrnac—have been engaged in a price war and have forced prices down to a point which is said to be below the cost of production. Prices were so low and are changing so rapidly that for the past two months practically all foreign competition has been shut out.

It is reported that negotiations are now under way to end the price war and to establish a general sales or control office which will attempt to fix sales quotas for the domestic manufacturers and to stabilize prices.

Despite the eternal state of affairs within the industry and the general depressed economic conditions through which the world is passing, Czechoslovak manufacturers are finding increased outlets for their mechanical rubber goods, as revealed by the latest 1930 statistics.

Austrian Industry Makes Gains

The Austrian industry is centered in the Semperit company which controls the entire capital stock of the two most important rubber concerns in the country. The domestic output of mechanical rubber goods comprises approximately one-third of the total annual volume of rubber goods produced. During the last few years the advanced production of mechanical rubber goods was caused by an increase of activity in most Austrian industries, but recently Austria,

Rubber Transmission Belting in Service at the Krupp Works, Germany

Exports of Mechanical Rubber Goods by Principal Countries

Country of Origin	1927 *Value*	1928 *Value*	1929 *Value*
United States	$7,225,207	$7,225,263	$8,251,624
United Kingdom	3,788,573	4,317,305	(1)
Germany	2,451,557	2,739,128	3,221,017
Canada	757,631	728,108	828,232
Belgium	293,790	342,857	408,799
Czechoslovakia	225,730	209,775	160,728
Norway	362,853	320,499	(1)
Italy	159,944	136,417	148,733
Sweden	52,001	51,777	59,317
Spain	(2)	139,913	22,854

[1]Not available.
[2]Not separately enumerated.

like the other countries, has suffered from depressed economic conditions.

Mechanical rubber goods are produced in Hungary and are reported to be of good quality. The principal manufacturer is the Hungarian Rubber Goods Factory (Ltd.), of Budapest, a portion of whose capital is controlled by the Dunlop company of Great Britain.

The Belgian rubber industry has perhaps shown more remarkable progress in recent years than other countries and along with this advancement has gone the production of mechanical rubber goods. The industry is led by the Englebert company of Liege, but two other factories, Jenatzy-Leleux and Soc. Anon. pour le Commerce et L'Industrie du Caoutchouc, also produce considerable quantities.

Belgium being regarded as the most highly industrialized country in the world naturally consumes large volumes of mechanical rubber goods. The local industries drew chiefly on the home factories, but not insignificant quantities are imported. A very good export trade exists in both belting and hose.

Manufacture in Scandinavia

The manufacture of mechanical rubber goods in Norway is concerned chiefly with rubber belting. As the country is not highly developed industrially, only a small portion is consumed locally and the remainder exported. For the past few years the rubber-belting exports have been between 300,000 and 400,000 pounds annually.

The Dansk Gummi & Galoschefabrik, the principal rubber manufacturer in Denmark, is under very able and active management. It has recently been reconstructed and has enlarged its manufacturing facilities to include rubber boots and certain mechanical rubber goods, chiefly belting and hose.

Swedish production of rubber hose and belting is in the hands of a few large concerns, that is, Trelleborg Rubber Factory at Trelleborg, the Skandinaviska Gummi Aktiebolaget at Viskafors, and Svenska Gummifabriks Aktiebolaget at Gislaved.

Far East and Africa

Japanese manufacturers have reached within the past few years a high degree of success in their production of rubber manufacture, including mechanical rubber goods. Large quantities which go to supply the requirements of the many industries within the Empire are turned out yearly. The export trade in this class is not developed to the extent of tires and footwear, although exports to adjacent markets are far from nil. Among the companies which manufacture such products are Dunlop, Mitatsuchi, Settsu, Tokyo Rubber Industrial Company, and Meiji.

Although the production of rubber goods in Australia, especially tires, has obtained a high state of efficiency, the production of mechanical rubber goods has not reached the stage when the country can be wholly dependent on its own production. The principal portion of the domestic consumption is still supplied by foreign manufacturers.

The Union of South Africa with its extensive mining operations was formerly one of the best outlets for mechanical rubber goods, until the South African Rubber Mfg. Co. was established and began the production of belting and other mechanical rubber goods upon a large scale. The local concerns favor the domestic factory and have thus reduced the importance of South Africa as a principal market for mechanical rubber goods.

More than a year ago it was reported that the Leyland & Birmingham Rubber Company, of Great Britain, had acquired a controlling interest in the South African company. Consequently, the local industry has been strengthened and is more able to compete with foreign manufacturers.

Production in South America

The manufacture of mechanical rubber goods is only slightly developed in the South American continent. Brazil produces the better portion of the local consumption of rubber hose, but the country is still dependent upon outside sources for the remaining rubber products of a technical nature. Chile is practically negligible as a producer. Argentina is the foremost manufacturer.

During the World War, when the principal rubber manufacturing countries were engaged in the production of war materials, the Argentine manufacturers were able to build up an attractive domestic trade. Principal mong these local producers was the India Rubber, Gutta Percha & Telegraph Works Company (Ltd.), a subsidiary of the British concern. It was found necessary to increase the works to such an extent that it was able to produce almost every class of mechanical rubber goods. Since the cessation of hostilities, however, the domestic production has suffered from the competition of the imported product.

If the plans materialize for the production of automobile tires in Argentine by several of the larger and well known international rubber companies, it is only reasonable to believe that the production of mechanical rubber goods on a large scale will follow.

I. R. I. to Visit U. S. in 1932

AN invitation extended by the Rubber Division of the American Chemical Society to attend its autumn meeting on September 5, 1932, has been accepted on behalf of the members of the Institution of the Rubber Industry, London.

The Rubber Division is most anxious that the visit should be a success, and hopes that the members of the Institution attending will contribute to the program of papers and will take part in the discussions at the conference. Arrangements are to be made to enable the party to inspect rubber factories during the course of the tour.

The council of the Institution of the Rubber Industry has appointed a sub-committee, consisting of Dr. S. S. Pickles, Dr. D. F. Twiss, B. D. Porritt, and Dr. P. Schidrowitz, to make arrangements for this visit, and preliminary arrangements have already been made.

Plantations Pay Stock Dividends

It would seem that financing of a new order is called for if individual plantation undertakings are safely to weather the present crisis in the rubber industry. A precedent has just been set by two well-known ventures, and it is almost certain to be followed by others in similar circumstances. The Anglo-Java Rubber & Produce Co. and the Laras (Sumatra) Rubber Estates are asking their debenture holders to accept for the next two half-yearly payments eight per cent, cumulative preference shares of 2s. each, instead of at the rate of 7 per cent annually.

Rubber Chemists in Session at CINCINNATI MEETING

Though Attendance Was Not as High as Usual, Number Was Satisfactory Considering Condition of Industry — Twelve Interesting Papers Presented.

THE meeting of the Rubber Division, A. C. S., held in the library of the University of Cincinnati, Cincinnati, Ohio, on September 10th and 11th in conjunction with the 80th meeting of the Society, was attended by 150 members and guests. This number was in excess of expectations in view of the curtailment of activities of the rubber industry in general.

That the meeting was successful is indicated by the character of the twelve papers which were presented (for abtracts, see THE RUBBER AGE, September 10, 1930, issue) and the discussion which followed each paper. There appeared to be more comment on these papers than at any previous meeting of the Division which can be accounted for by the fact that every paper was reviewed by a committee several weeks before the meeting. The reviewers naturally led the discussion with the result that other members were inclined to ask questions and add their thoughts to those of the various authors. It is to be hoped that discussions on all future papers will be as plentiful and helpful as those of the recent meeting.

Following the reading of the papers on Thursday morning, September 11th, Dr. A. A. Somerville, chairman of the Physical Testing Committee, submitted his report on the work of the committee in the rating of laboratories. It was brought out in this report that although 250 laboratories were addressed, only fourteen asked for a rating, nine of which were from rubber goods manufacturers, one reclaimer, two chemical supply houses, and two automobile manufacturers. The average rating of these fourteen laboratories was 51% toward compliance with the committee's Tentative Standard Procedure. The full report appears on the next page.

The secretary-treasurer read the financial report which showed that there was a balance of $1,208.94 in the treasury with which to meet the expenses of the printing of the next issue of *Rubber Chemistry and Technology*, as well as other expenses up to the end of the year. The report also covered the membership of the Division, showing that the total membership was 609 after one hundred and forty-seven 1929 members had been dropped. The complete report appears elsewhere on this page.

No new business was brought up and the meeting proceeded with the election of new officers for the coming year. H. A. Winkelmann, (Palmer Gas Products Corp.), was elected chairman to succeed Stanley Krall, and E. R. Bridgwater, (Du Pont), was elected vice-chairman succeeding Mr. Winkelmann. Dr. H. E. Simmons was re-elected secretary-treasurer and Edward Nahm (Naugatuck), was elected Sergeant-at-Arms, succeeding Mr. Bridgwater. A complete list of new officers including the executive committee is given above.

On Wednesday evening, the dinner of the Rubber Division was held in the ballroom of the Hotel Gibson with

NEW OFFICERS
Rubber Division, A. C. S.
(1930-1931)

Chairman: H. A. Winkelmann *(Palmer Gas Prod.)*
Vice Chairman: E. R. Bridgwater *(duPont)*
Secretary-Treasurer: H. E. Simmons *(Akron Univ.)*
Sergeant-at-Arms: Edward Nahm *(Naugatuck)*

EXECUTIVE COMMITTEE

N. G. Madge *(U. S. Rubber)*
T. K. Hinshaw *(Goodyear)*
H. F. Palmer *(Xylos)*
D. J. Beaver *(General Atlas)*
Stanley Krall *(Fisk)*

REPORT OF SECRETARY-TREASURER
Rubber Division, A. C. S.

(*Cincinnati, Sept.* 11, 1930)

FINANCIAL REPORT

Balance in Bank at Atlanta Meeting April 9, 1930	$1579.39	
Dues and Subscriptions	280.17	
		$1859.56
Expenditures		
Expenses of Secretary to the Atlanta Meeting	83.50	
Stenographic Services	90.00	
India Rubber World — Reprints	88.66	
Palmerton Publishing Company — Reprints	49.52	
Mack Printing Company	10.46	
Ben Franklin Printing Co.	13.75	
University of Akron — Postage, Telegrams and office supplies	23.36	
Translations	287.29	
Refunds	4.00	
Correction of 8c — foreign checks and drafts	.08	
Total Expenses	650.62	650.62
Balance on Hand		$1208.94

MEMBERSHIP REPORT

Number of Members	401
Number of Associate Members	107
Subscriptions	72
Honorary Members	29
Total Membership	609
Number of members in 1929 that dropped their membership	137
Number of subscriptions in 1929 not renewed in 1930	10

Respectfully submitted,

H. E. SIMMONS, *Sec.-Treas.*

REPORT OF PHYSICAL TESTING COMMITTEE
Rubber Division, A. C. S.

(*Cincinnati, Sept.* 11, 1930)

At a meeting of the Committee held prior to the last meeting of the Rubber Division six months ago, it was considered desirable that rubber testing laboratories should be made acquainted with the "Outline of Tentative Standard Laboratory Procedure for the Preparation and Physical Testing of Rubber Samples," and that laboratories should be rated in order that they might know how well they are equipped for complying with the Standard Laboratory Procedure, and encouraged to conform more closely with that procedure.

The Committee is not being financially supported by the Rubber Manufacturers Association this year. Accordingly, the three chemical supply companies represented on the Committee volunteered the services of several of their men to rate laboratories wherever they were invited to do so. The Secretary of the Rubber Division addressed a circular letter to about two hundred and fifty rubber testing laboratories on this subject. Requests were received from fourteen laboratories asking for rating. Nine of these were from rubber goods manufacturers; one reclaimer, two chemical suppliers and two automobile manufacturers.

It would appear that there is no great demand for a rating of laboratories.

It might be added that the fourteen laboratories visited received an average rating of 51% toward compliance with the Tentative Standard Procedure. No other work has been done by the Committee during the past six months.

Respectfully submitted,

A. A. SOMERVILLE, *Chairman.*

Bill Whitcomb as toastmaster. After the well-served dinner during which several songs were sung by the members, the toastmaster introduced Charles L. Parsons, secretary of the American Chemical Society, and Dr. H. E. Howe, editor of *Industrial and Engineering Chemistry,* who spoke very briefly. The main features of the evening consisted of music and songs by members of the WLW radio station with announcer William Brown as master of ceremonies. This feature was well received by the audience, and the entertainment committee, consisting of C. W. Sanderson, chairman, W. H. Juve, and Harold Gray, are to be congratulated on the success of the evening. Souvenirs at the dinner on the part of suppliers consisted of an old-fashioned New England cigar lighter, donated by Godfrey L. Cabot, Inc.; a set of four rubber coasters, donated by General Atlas Carbon Company; and a set of playing cards donated by Rubber Service Laboratories Company and Federal Color Laboratories, Inc.

The next four meetings of the American Chemical Society are scheduled as follows: Spring, 1931, Indianapolis; Fall, 1931, Chautauqua, New York; Spring, 1932, New Orleans; Fall, 1932, Denver. There is still some doubt as to whether the Fall, 1931, meeting will be held at Chautauqua but an official announcement may be expected from the Society very shortly.

Rubber Acreage in Siam

THE official figures of the acreage planted to rubber in Siam, as supplied by the Siamese Ministry of Lands and Agriculture, show a progressive increase yearly since 1925. Over half of the total acreage is still immature. The official statistics are as follows:

Acreage and Yield of Rubber Plantings in Siam

	Total Rubber (Acres)	*Mature Rubber* (Acres)	*Yield per Acre* (Average)
1925	85,259	57,473	150
1926	101,630	64,979	178
1927	153,005	88,256	249
1928	198,497	99,949	250
1929	302,836	121,023	221

Beharrell Award for 1930

THE Beharrell Prize of five pounds will be awarded through the Council of the Institution of the Rubber Industry, London, for the year 1930 for an essay dealing with "Methods of Costing in the Rubber Manufacturing Industry," which in the opinion of the Council is considered the best and which is submitted by a member of the rubber industry, not necessarily of British nationality or a member of the Institution of the Rubber Industry.

There is no restriction as to age or position in the industry. The length of the essay should not exceed 5,000 words and must be accompanied by a brief summary not exceeding 200 words. The essay should be of such a nature that it will stimulate interest not only amongst cost accountants, but also amongst those connected with the sales, production and technical aspects of the rubber manufacturing industry.

The essay must be submitted under a nom de plume, the actual name and address of the author being enclosed in a sealed envelope addressed to the secretary of the Institution of the Rubber Industry. The identity of each author will be treated as strictly private and confidential until the award has been decided.

Essays in connection with the 1930 award of the prize must reach the offices of the Institution of the Rubber Industry, Faraday House, 10, Charing Cross Road, London. W. C., not later than 31st December, 1930. Essays sent from overseas may, however, be received up to the 21st of January, 1931.

Bentonite

A NEW natural colloidal clay is being offered to the rubber manufacturing industry, under the trade name of "Bentonite," by Hammill and Gillespie, Inc., 225 Broadway, New York City.

Most any aluminum silicate ground sufficiently fine, dry, and with aluminum content as high as possible, and the silica preferably low, may be employed as a filler and reenforcing agent in rubber mixes, but true colloidal clay and its distinctive advantages are less generally known.

Bentonite is a form of hydrous aluminum silicate with peculiar properties of swelling and absorbing water to the extent of about 400 per cent by weight of water, its volume increasing about twelve times. It is recommended for latex and other rubber dispersions to the extent of 10/15 per cent.

C. P. colloidal clay is specially purified English china clay, resulting in an inpalpable white powder of pharmaceutical purity. Approximately only 25 per cent of the original weight of clay is recovered by the special process used in its refining to a 99.8 per cent clay substance. The cost of this limits its use to high-class stocks as a white reinforcing agent comparable with carbon black in dark stocks, and as a dusting colloid to absorb bloom, improve color, life, and aging qualities of acid cured goods.

KUNHARDT'S "FUTURE OF RUBBER"

COPIES of Lt.-Colonel J. C. G. Kunhardt's very interesting booklet on "The Future of Rubber," extensively reviewed recently both here and abroad, are now available in this country through THE RUBBER AGE. The booklet is published by the Rubber Shareholders Section of the Institution of the Rubber Industry, London, and is a comprehensive survey of present conditions surrounding the plantation industry and concludes with a broad and authoritative view of the possible situation in the future. The book is interesting reading for all those associated with the industry. Sent postpaid upon receipt of 65 cents (stamps or currency) by THE RUBBER AGE, 250 West 57th Street, New York City, N. Y.

Diagnosing the Ills of the RUBBER INDUSTRY

An Interview With William O'Neil, President, General Tire and Rubber Company, in Which He Tells Why Failure and Distress Has Come to the Tire Trade.

WILLIAM O'NEIL

WHAT spells success in the tire industry? Does successful tire manufacturing mean, necessarily, a huge annual volume of production? Is the truest success always associated with immense plants with hundreds of acres of floor space? Does an impressive "front" always indicate the greatest proportionate profit?

"No!" says William O'Neil, president of the General Tire & Rubber Company, in an interview, in which he discusses various phases of the present deplorable situation within the industry.

"To succeed in the tire industry, don't take foolish business," is the advice that Mr. O'Neil gives.

That he speaks with authority is evidenced by the fact that the General Tire and Rubber Company, of which he is president, is one of the few rubber companies which has never failed since its organization, to pay regular dividends in cash on both classes of its stock. This company's tangible assets behind each share of its common stock are nearly three times as great as those of the next company to it. Its earnings per share of common stock on the basis of capitalization are larger and its inventory in comparison with its sales is lower than any of the other major rubber companies.

Past Mistakes of the Industry

"We have tried to avoid the mistakes that some other tire manufacturers have made," Mr. O'Neil said. "Among these mistakes are: underestimating the ability of your competitor; figuring mill-door costs and not final costs; letting the factory production ticket force the sales department; increasing the number of outlets, which raises the cost of selling but does not increase the demand; taking and seeking outlets for merchandise that interfere with present outlets; giving unfair advantage in the way of special prices to certain new retail outlets which destroys the profit in the business of present outlets; letting the buyer write his own price ticket; being too greedy for volume; taking contracts that obligate only the seller—not the buyer; setting up impossible sales quotas and then organizing and spending money trying to attain them."

It is not enough, Mr. O'Neil admitted, merely to recognize unprofitable and unsuccessful methods in the tire industry. The aggressive use of constructive and successful methods is of at least equal importance, he pointed out.

"To avoid the mistakes that others have made in the tire industry," said Mr. O'Neil, "first apply the Golden Rule; don't give your old customer or your old representative an unfair deal by placing a new prospect in a better position to obtain business by granting him very much lower prices and different conditions and terms. Listen to new schemes of merchandising but remember that buying habits do not suddenly change and don't give unfair advantage because you see unfair advantage being promised to you. If you have built up a successful business on certain policies, don't be too hasty to tear it down because other people tell you a story about how efficiently they can operate. Let them prove it first.

Unfair Price Advantage

"Do not give them an unfair price advantage. Always play square with the trade that you now have for it has cost time and money to build.

Don't take foolish business. On the other hand, don't pass up close business even if it shows only a little profit when everything is taken into consideration, provided that business does not interfere with your regular outlets.

"Apply this rule on close business—does it compete with myself? Is it 'plus business' or not 'plus business'? Is it good business for our agents?

"Take the matter of plant investment. Let's consider two companies — General and one of the other larger companies.

"General has a fixed investment of about $1,500,000 in its plant. Figuring annual depreciation at 10 per cent and interest on the investment at 6 per cent, that makes 16 per cent on $1,500,000 or $240,000 a year which would be figured in merchandising terms as a merchant's rent. General's rent would be less than one per cent of its annual business.

"If the other company has a plant investment of $102,000,000, it must figure its annual rent at about $16,000,000 which happens to be 6 per cent of its annual business. While this other company's business is not confined to tire sales, its other lines compared with other companies making those lines, require less of an investment than its tire industry.

"In the past 10 years, General has increased its plant investment only 50 per cent but has increased its production, in dollars and cents, 450 per cent, and in units, much more than that. Another company, which has doubled its

plant investment in that time, has only increased its output 25 per cent.

"Comparatively low plant investment is one of the greatest factors in Henry Ford's continuing success. Factory overhead and extra advertising costs can be eliminated or cut down but factory investment is with you always.

"Since the total labor cost in a tire is not more than 12 per cent of the selling price, a differential of five per cent on the selling price, in matter of plant investment alone is a decided advantage.

"Take the steel business, for instance. United States Steel has a quick asset value greater than the price for which they stand on the books. This is true of any successful company that has been in business for a long time.

"General does not make any other lines of tires, under other names or other brands. It does not do this as it believes that such methods detract from the self-respect, the selling volume and the merchandise of its accredited dealers.

"General does not have in its line a tire that sells for 15 per cent less than its regular line. This is the worst kind of competition that a tire dealer can have—competition within his own store."

Rubber 'Cadavers'

LIFE-SIZE rubber models of the human body, to be used for instruction purposes in medical schools, is the most recent application of rubber to science. The composite model includes an exact replica of every bone muscle and organ of the human system. Small rubber models of various parts of the body have been utilized previously for purposes of study, particularly the abdominal tracts, liver, kidneys, and bladder, but now for the first time a complete rubber manikin has been developed.

Rubber Model of the Human Body

It is the work of Loyal Clark, of the Huntington Rubber Mills, Portland, Oregon, who has spent several years in developing the model to the point where it is anatomically perfect.

Danish Rubber Footwear Trade

The Danish demand for rubber footwear, which continued to show a steady expansion during 1929, also followed an upward trend during the first half of 1930, according to reports of the Department of Commerce. The consumption of winter footwear and of heavier goods in general was relatively low during the 1929-1930 season, owing to prevailing weather conditions, but the loss of this trade has been made up by a very material increase in the sales of summer rubber footwear, such as canvas rubber-soled shoes and the like.

The American position in the Danish market was well maintained during 1929 in all classes, except in rubber gaiters, in which the Danish industry continued to advance. Competition, however, grew increasingly keen during the first half of 1930 and indications at present point to growing competition in canvas footwear and lighter rubber boots.

The Danish consumption of rubber footwear has shown a very rapid growth during the last 10 years and has now reached an estimated yearly value of from 12,000,000 to 13,000,000 crowns (the crown equals $0.268). Of this total, 10,000,000 crowns represent imports, while the rest is of domestic origin. The domestic products are slowly gaining ground but imported footwear as yet dominates the market.

Denmark is largely a quality sales field, in the case of heavier footwear, while in the lighter products—notably in canvas rubber-soled footwear—the market is about evenly divided between the cheaper and the higher and medium-priced qualities. The trend appears to be toward the better grades, but in the case of summer goods, the shortness of the season tends to favor the cheaper lines.

The one Danish rubber-footwear factory, Dansk Gummi & Galoschefabrik, Copenhagen, specializes in the production of footwear, markets its products under the trademark, "Codan," is steadily increasing its production and rapidly becoming a major factor in the Danish rubber-footwear trade. The company is under very able and active management, has recently been reconstructed, and has enlarged its manufacturing facilities to include rubber boots and certain mechanical rubber goods, chiefly belting and hose, in addition to gaiters, rubbers, and canvas rubber footwear already included in its line of products. The products of the Danish factory are of excellent finish and high quality and the domestic factory on the whole specializes in quality.

The new rubber boots are of excellent appearance and form, somewhat lighter than the average boot used locally and are sold at from 8 to 10 per cent below the American prices. The new boot has only recently been placed on the market and its wearing quality is as yet unknown.

The actual volume of footwear production of the Danish factory is unknown but is estimated to reach a value of between 3,000,000 and 4,000,000 crowns a year. The last year's statement showed an increase in the total turnover from approximately 2,250,000 to 4,400,000 crowns. The gross earnings during 1929 amounted to 933,000 crowns and net profits to 500,000 crowns.

The immediate outlook for the Danish rubber footwear trade in some respects is somewhat clouded and uncertain and is apparently viewed with some concern by the trade. Competition — especially from the cheap lines, particularly from Poland — is growing very keen, and at the same time the threat of dumping through irregular channels of trade from overburdened domestic markets hangs over the Danish market.

LOOKING FOR A JOB? . . . There are a number of good positions open in rubber factories. Consult Classified Section, this issue, Page 661.

Standardization of Ozone Testing*

By E. P. W. Kearsley

The Fisk Rubber Company, Chicopee Falls, Mass.

PRIOR publications are discussed, which explain the aging of rubber by the influence of light and air. It is shown that, as has been demonstrated by other research workers, it is possible to accelerate and magnify this effect if rubber under tension is brought into contact with ozone. The difficulty encountered heretofore, when attempting to obtain comparable results, has been one of obtaining suitable and consistent concentrations of ozone for the experiments.

A method is described which provides favorable conditions for the conducting of such tests, and it is demonstrated that under such conditions constant and comparable values are obtainable.

It is further shown, that these results are of value when studying the properties of various compounds, and are especially adapted for the evaluation of ozone resistant compounds.

Proposals are made for the avoiding of ozone cracking, and the necessity of intensive research work in this field and the possibility of correlating the results obtained with ozone aging with natural aging is emphasized.

THE progressive deterioration of soft vulcanized rubber, proceeding independently of actual wear, has always been a source of annoyance to the trade. Although evidences of such deterioration are varied in character, the many forms may be conveniently classified as surface deterioration and deterioration throughout the rubber.

Surface deterioration, characterized by superficial film formation, is greatly accelerated when vulcanized rubber is exposed to light, particularly rays of short wave length, but that this function of light in the destruction of rubber is indirect in operation was recognized as early as 1883, by Burhardt (*Jour. Soc. Chem. Ind.* 2, 119, 1883). The agency responsible for the changes which rubber undergoes on exposure to the atmosphere is undoubtedly oxygen, and suggested by Spiller (*Jour. Chem. Soc.* [London] 18, 44, 1865), as far back as 1865. That oxygen is essential for the deterioration of rubber has been shown by Fickenday (*Kolloid Ztg.* 9, 81, 1911), and many others since. The effect of sunlight on either raw or vulcanized rubber, is believed by Henri (*Caout. et Gutta Percha* 7, 2848, 1909) to be analogous, although Peachy and Leon (*Jour. Soc. Chem. Ind.* 37, 56T, 1918) offer the opinion that vulcanized rubber oxidizes less rapidly than raw rubber. Later investigators have proceeded still further in their conclusions, and Tuttle (*The Rubber Age*, N. Y. 8, 271-2, 1921) states, after studying the acetone solubility curves of vulcanized rubber exposed to light, that the action of the latter is one of oxidation, which when once started proceeds rapidly, due to the catalyzing effect of small amounts of oxidized rubber so formed.

That oxidation may be a secondary effect of light is entirely possible, and Whitby (*Plantation and Rubber Testing*, 1920) and van Rossem (*India Rubber Journal* 48, 172, 1914) are of the opinion that oxidation is preceded by certain physical changes. This point is further substantiated by the findings of Asano (*India Rubber Journal* 70, 9, 352, 1925), who was able to produce benzol insoluble products by exposing raw rubber to the action of ultraviolet light, even when the samples were enveloped in inert gas, and concludes that oxidation is a secondary effect following an individual action exerted by the ultraviolet rays themselves.

An extremely interesting phenomenon associated with the film formation already referred to, is the so-called "sun-checking" or "sun-cracking" which results from exposing vulcanized rubber under tension to the action of sunlight, and probably due to the decreased elasticity of the oxidation products constituting the film formation, with consequent cracking under the tension present.

Williams (*Ind. Eng. Chem.* 18, 4, 369, 1926) has offered experimental evidence indicating the presence of ozone as necessary for the production of this cracking, the probability of which was previously suggested by Haushalter (*India Rubber Journal* 70, 20, 897, 1925), in his publication on the measurement of the effect of corona on rubber subjected to high voltages, and Peritor (*Gummi Ztg.* 40, 95, 1925), who goes so far as to suggest the use of ozone as a testing agency for rubber deterioration.

The apparent greater tendency of vulcanized rubber to crack under exposure to ozone, when maintained at a definite degree of elongation, has been noted by Shepard, Krall and Morris (*Ind. Eng. Chem.* 18, 6, 615, 1926), and Somerville *et al* (*The Rubber Age* [N. Y], Dec. 10, 1929), in investigating the effect of aging rubber under varying elongations, found that the effect of ozone and sunlight were analogous, and emphasized the point that an elongation of 5% to 10% of the rubber constituted a critical stretch at which maximum cracking resulted on exposure of vulcanized rubber to either of these agencies.

It has been the purpose of the present investigation to expand on the reported observations by studying the various factors which influence the degree and type of cracking produced on exposing vulcanized rubber under tension to the action of ozone, and by systematic correlation of the results obtained, to develop a standardized technic for the ozone testing of rubber products.

Apparatus and Method

A constant source of ozone, as regards concentration and volume, is obviously a prime requisite if consistent results are to be obtained, and in the choice of apparatus for this work, adequate control of the factors governing the rate of ozone generation, i.e., humidity of the air supplied to, and temperature of the ozonizing chamber, were carefully considered.

The ozonizer proper is a modification of the apparatus described by Smith (*Jour. Am. Chem. Soc.* 47, 7, 1844, 1925), consisting of a Berthelot tube A. (Figure 1.), the inner electrode being formed of mercury, and the outer electrode by wrapping the external tube with tinfoil and protecting with a thick coat of beeswax. The tension between the electrodes (5.000-17,000 V.), is furnished and regulated by means of a 0.5 k.v.a. autotransformer. The temperature of the ozonizing chamber can be regulated to within 1° C. by means of a water bath B. which entirely surrounds the ozonizer. The air to the ozonizer is dried by passing through columns of calcium chloride E., sulphuric acid F., and glass wool G., and its

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*Presented before the Deutsche Kautschuk-Gesellschaft, Frankfort-am-Main, June 16, 1930.

EDITOR'S NOTE: Since the delivery of this paper the author has severed his connections with the Fisk Rubber Company and is at present associated with the United Carbon Company, Charleston, W. Va.

rate of flow is measured and controlled by flowmeter D. Proper dilution of the ozonized air to the desired concentration is accomplished in a mixing bottle I., by means of air introduced through flowmeter H. From this point it is supplied to the testing chamber J., where it is kept in constant circulation by the fan K.

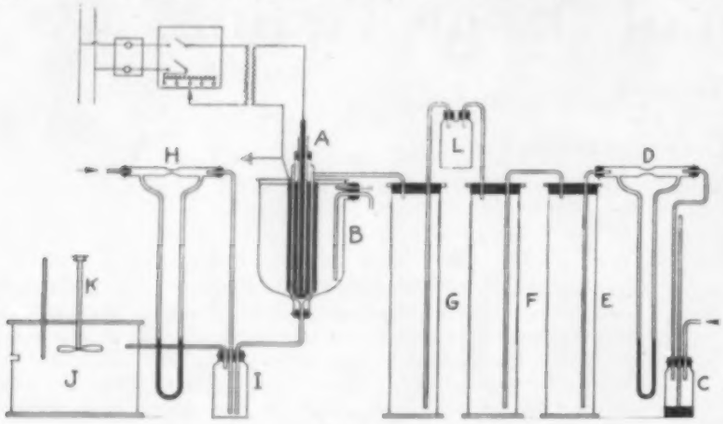


Figure 1

The specimens of rubber to be exposed consist of strips 3″ x 0.5″ x 0.1″, on which a longitudinal section 1″ in length is accurately marked. The strip is laid flat on a board, one end fastened, the desired elongation obtained by stretching until the 1″ section assumes the proper proportions, and the opposite end secured. All observations were confined to the 1″ section, the percentage elongation of which could be accurately determined.

The concentration of the ozone being supplied to the exposure chamber was constantly checked, the method employed being that described by McDonnel (*Ind. Eng. Chem.* 18, 2, 135, 1926), in which the ozonized air is bubbled through potassium iodide and starch solutions, to which sodium thiosulphate has been added in amount equivalent to a definite and suitable iodine standard. When the iodine liberated by the ozone from the potassium iodide solution exceeds the reactive limit of the sodium thiosulphate, the starch indicator turns blue, and from the time required for the completion of the reaction and the volume of ozonized air bubbled through, the concentration is determined. Preliminary work indicated a dilution of 1; 50,000 to be best suited for comparative purposes after an exposure of 30 minutes, and was the dilution adopted for the entire work reported in this paper, except of course, where the effect of varying the concentration was being observed. The exposure period selected was 30 minutes and was used for all tests.

Experimental Part

In studying the effect of fundamental variables, a pure gum stock was used composed of rubber-100, sulphur-3, zinc oxide-5, and Captax 0.5. The influence of compounding ingredients was investigated on the same stock to which had been added 10, 20 and 30 volumes on the rubber of zinc oxide, carbon black and natural ground whiting.

A cure just below the optimum was selected as best serving the purpose of the work ,and was employed in all cases excepting where the effect of the state of cure was under observation.

The term maximum cracking, where used for the purpose of description in this report, implies the first point in a series of elongations at which the surface of the sample under examination was entirely covered with cracks (see Figure 2).

All series were allowed 72 hours stretch period before exposing them to ozone, for reasons which will be discussed under the effect of varying the stretch period.

For the purpose of comparison, all strips were uniformly stretched to 100% after the exposure period, and the series illustrated in this paper were photographed at this elongation.

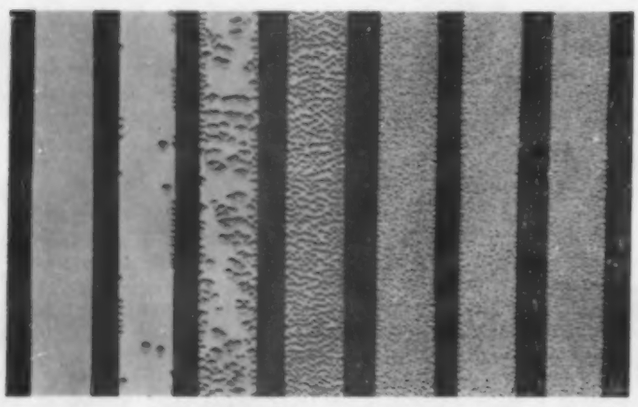
Effect of Varying Elongation

The apparent tendency of ozone to exert its greatest activity on vulcanized rubber at certain elongations, reported in the literature by several observers, was studied by exposing series of various stocks, representing a range of stretch from 0 to 100%. The results obtained indicated the influence of elongating rubber on its reaction to exposure to ozone to be of a dual nature. First, the greater the elongation employed, the smaller became the dimensions of the individual cracks, and secondly, the number of cracks resulting from the exposure increased proportionally to the degree of elongation up to a point of maximum cracking, which in the case of a pure gum stock occurred at 10% elongation.

The elongation of maximum cracking, or "critical elongation," varied for different types of stocks, a point also observed by Kelly, Taylor and Jones (*Ind. Eng. Chem.* 20, 3, 296, 1928), in connection with their study of sunlight aging and will be referred to again under the effect of compounding.

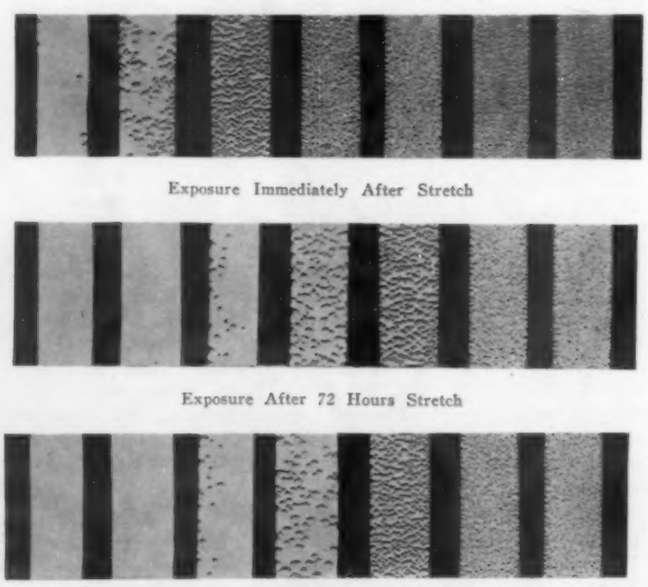
Effect of Varying Stretch Period Before Exposure

Early in this work, it became apparent that the stretch period to which a stock was subjected before its exposure to ozone, had a marked influence in determining the degree of elongation at which maximum cracking was produced. When a series of progressive elongations of rubber stock was given increasing periods of stretch, from 1 minute to 120 hours, before exposure, the point of maximum cracking evidenced a decided shift in the direction of higher elongation. This was particularly noticeable in the instance of a highly



Maximum Cracking at 20%

Figure 2



Exposure Immediately After Stretch

Exposure After 72 Hours Stretch

Exposure After 120 Hours Stretch

Figure 3

compounded stock, and quite slight in the case of pure gum stock.

Indications were that this shift is proportional to the duration of the stretch period up to 72 hours, at which time equilibrium was established regardless of the extent of the compounding. Figure 3).

This observation substantiates the findings of Haushalter, Jones and Schade (*Ind. Eng. Chem.* 20, 3, 300, 1928) that the degree of cracking obtained is dependent on the stresses existing in a stock rather than its elongation, all other conditions being equal. Increasing the duration of the stretch period correspondingly increases the permanent set, resulting in decreased tension existing although the elongation may remain the same, a point also noted by Balazo (*Gummi Ztg.* 43, 708, 710). This decrease in tension, termed "tension loss" by Ariano (*Il Nuovo Cimento*, March, 1929), continues until equilibrium is established, when the stresses existing at an arbitrary elongation correspond to those which existed originally at a lower elongation. Hence, if 15% represents the critical elongation when a sample is exposed immediately after stretch this point will have shifted to a decidedly higher elongation when subjected to 72 hours under tension before exposure.

Effect of Ozone Concentration and Duration of Exposure

Exposing a series of rubber compounds to the action of different concentrations of ozone, under varying degrees of stretch, showed that the type and number of cracks produced at a given elongation,

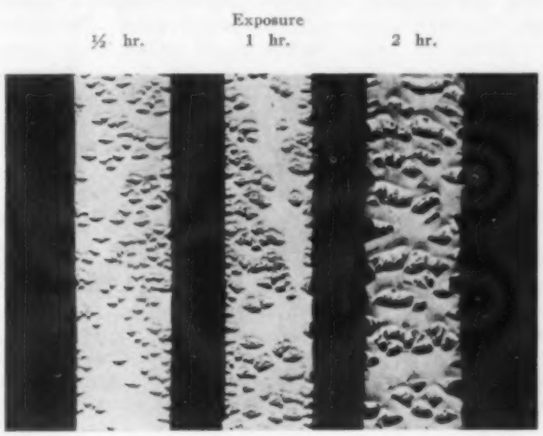


Figure 4

were not materially affected by the concentration used. The intensity of the individual cracks was, however, greatly increased proportional to the concentration of ozone, and the length of exposure required for the production of a given degree of cracking was correspondingly reduced.

Increasing the exposure period, the concentration of the ozone remaining the same, gave similar results (Figure 4).

Effect of State of Cure

For the purpose of investigating the role played by the state of cure existing in a stock, in its susceptibility to cracking on exposure to ozone, a series representing a range of cures from zero to a decided overcure was tested at a predetermined elongation critical for the stock used.

The results obtained indicated that overcure when compared with the proper cure, had little influence on the extent of cracking produced. There did exist, however, a slight tendency to greater intensity of cracking in the overcured samples, which is in agreement with the findings of Krahl (*Kautschuk* 159-60, 180-3, 1927).

Undercured samples exhibited less cracking, especially as the state of no cure was approached. This is probably due to the greater mobility which exists in the lower cures, with consequent increased accommodation to the tension applied resulting in decreased internal stresses and less resistance to the stretch applied being developed, than in higher cures at the same elongation.

Effect of Temperature

Comparative tests carried out at increased temperatures, evidenced a slight shift to have taken place in the point of maximum cracking toward lower elongation. Also, the time of exposure necessary to produce a given degree of cracking was materially reduced. A series exposed at 160°F. required about half the exposure necessary to produce similar intensity of cracking at 60°F.

The observed shift in the critical elongation is undoubtedly due to the tendency of vulcanized rubber to contract when subjected to increased temperatures (Joule Effect), which according to Williams (*Ind. Eng. Chem.* 21, 9, 872, 1929), increases its resistance to strain, thus creating additional stresses.

It is natural to expect an increased activity of the ozone at higher temperatures, but no doubt the reaction is accelerated by the more receptive surface which results from the depolymerization products formed.

Freezing vulcanized rubber, as was anticipated, produced an effect directly opposite to that obtained by heating. Series of elongations of both pure gum and compounded stocks, when embedded in CO_2 snow, with one surface only exposed, for half an hour before and during the ozone test period, gave no indication of cracking even after several hours' exposure to increased concentrations of ozone. On allowing such samples to return to room temperature, however, and again exposing them, cracking resulted in a normal manner except that the critical elongation shifted to a slightly higher position in the series. Similar treatment of stocks at somewhat higher temperatures but below 0°C., while not entirely eliminating ozone cracking showed the latter to have been retarded considerably, a decided influence being exerted on the critical elongation, which experienced a progressive shift in the direction of higher elongation commensurate with the degree of cold at which the test was conducted.

Effect of Humidity

Conducting tests at varying degrees of humidity had no noticeable effect on the results obtained. Neither the type nor the intensity of the cracks produced were effected to a visible extent, and the critical elongation remained constant. It is quite probable, however, that the conditions reported by the Physical Testing Committee of the Rubber Division, A. C. S. (*Ind. Eng. Chem.* 20, 11, 1245, 1928), regarding the effect of humidity changes on the physical properties of vulcanized rubber, maintain for this method of aging although external manifestations were too slight to be observed.

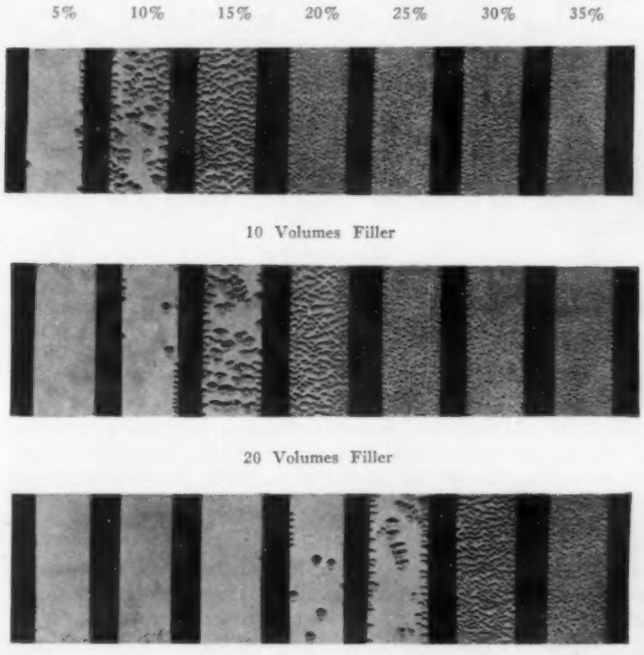


Figure 5

Effect of Compounding

As mentioned earlier in this paper, the critical elongation of any stock depends on the tension present, and to what extent this tension exceeds the breaking stress of the superficial film produced by the exposure to ozone. This tension is governed by the stretch applied and the permanent set of the stock. Since varying amount of compounding ingredients has been shown by North (*India Rubber World* 63, 98, 1920) to materially affect the permanent set, it is

natural that such variations should also influence the critical elongation of a rubber stock. The accuracy of this assumption was demonstrated by observing the effect of ozone on three stocks containing 10, 20 and 30 volumes of zinc oxide, respectively. Comparison of the results obtained showed a considerable shift in the critical elongation to occur in the direction of increased stretch, and proportional to the loading of zinc oxide employed. For 10 volumes of filler the critical elongation was located at 15% stretch, which point had shifted to 20% when the zinc oxide was increased to 20 volumes, with a further shift to 30% stretch when 30 volumes of the filler were used (Figure 5).

Vogt and Evans (*Ind. Eng. Chem.* 15, 1015, 1923), in studying the effect of fillers on the properties of rubber stocks, classified them into two groups, depending on whether they were productive of isotropic or anisotropic physical characteristics, when the stocks into which they were incorporated were tested in different directions. Considering these classes separately, they found that the smaller the particle size the greater was the permanent set when the same volume loading was employed. To demonstrate the application of this observation as a determinant of the critical elongation in the ozone testing of rubber stocks, three stocks containing 10, 20 and 30 volumes on the rubber of whiting, zinc oxide and carbon black were exposed in series to ozone. These ingredients represent a wide range of particle size, being approximately 5.0μ, 0.5μ and 0.1μ, respectively. As it was impossible to adequately illustrate by means of photographs the comparative results obtained, they are offered in tabulated form.

		Critical Elongation		
Filler	Particle Size	10 *Volumes Loading*	20 *Volumes Loading*	30 *Volumes Loading*
Whiting	5.0μ	10%	12%	15%
Zinc Oxide	0.5μ	15%	20%	30%
Carbon Black	0.1μ	20%	35%	50%

It will be noticed that as the particle size of the filler decreases, the elongation at which maximum cracking occurs is increased. This effect may be explained on the basis of permanent set, which, increasing proportional to the total surface area of the filler particles, exerts a correspondingly neutralizing effect on the tension produced by elongation to a given stretch, requiring the degree of elongation necessary for the development of a definite tension to be increased with the volume loading.

Discussion

The very low tensile strength of the film produced by ozone on the surface of rubber under tension, apparently offers the best explanation for the cracking phenomenon associated with it. As compared with rubber, this film has an extremely low breaking stress, with the result that in some cases an elongation of 5% to 10% in the rubber, is sufficient to develop a tension exceeding this breaking stress. At this point cracking of the film proceeds until the tension is reduced below this limit. That the number of cracks produced per unit area depends on the extent to which the tension present exceeds the breaking stress of the film, is well illustrated by the results obtained by varying the elongation of the rubber during its exposure to ozone. In the lower elongation, where the tension only slightly exceeds the breaking stress, the number of cracks appearing were few, while in the higher elongations in which greatly excessive tensions were developed, the cracking became so extensive as to, in some cases, cover the entire surface of the rubber.

The observed variations in magnitude of the individual cracks, when considered from the results obtained using increasing concentrations of ozone, appear to be controlled by the thickness of the film formed. Of the factors investigated, high concentrations of ozone, increased temperature during exposure, and increased exposure periods, all of which may be expected to increase the thickness of the resulting film, invariably exhibited a marked influence on the dimensions of the individual cracks, being enlarged in each case. It is quite interesting to note, that the introduction of carbon black into a rubber compound produces similar, even if less pronounced effect. No explanation of this point is offered, but the high absorptive capacity of the carbon black suggests a possible solution.

The close relationship between the tension present in the rubber and the degree of cracking developed superficially by ozone, obviously implies that conditions productive of stress-strain changes will indirectly control the extent of cracking exhibited by any one stock. The variations observed when the duration of the stretch period before exposure is increased, must, therefore, be explained as resulting from the changes taking place in the stress-strain relationship during the stretch. Such changes will cease when equilibrium has been established between the plastic and elastic properties of the rubber, which for all stocks studied up to an elongation of 100%, a stretch period of 72 hours proved sufficient.

The influence of fillers has an important bearing on the number of cracks per unit area that will be produced at a given elongation. That the stress-strain relationship of a rubber stock is considerably affected by the particle size and extent of loading has been shown, and the application of this effect in compounding may offer a new point of attack on the problem of retarding ozone cracking. When the range of stretch to which rubber is likely to be subjected during service is known, it seems quite possible that by proper compounding the tension that will be developed by the rubber within the range of stretch so determined, could be controlled so as to assure a minimum if not complete elimination of cracking during its subsequent exposure during service to atmospheric conditions. Since the paraffin treatment of rubber as a protective measure against oxidation was patented by Kreusler and Budde (*D. R. P.* 18, 740, Aug. 26, 1881), it has been customary to combat the problem of surface cracking by the introduction of ingredients, which by virtue of their tendency to bloom out to the surface afford a certain amount of protection to the rubber. Experience indicates such protection may be quite temporary, and products so treated when placed in service likely to cause the rubber surface to be robbed of its protective coating, by abrasion or otherwise, show the efficiency of this procedure to decrease rapidly.

The retarding of cracking by control of the tension developed at a specified elongation through the medium of suitable compounding, if and when possible, should be permanent, which point the author considers of sufficient importance to merit further investigation. Preliminary studies along this line have been quite encouraging and additional observations are contemplated.

Summarizing, the results obtained in the course of the present investigation indicate that when the factors which tend to influence the activity of ozone on rubber under tension are adequately controlled, consistent and comparable results may be obtained. That these results are sufficiently significant to evaluate the ozone retarding properties of individual stocks, and the usefulness of the various ozone resisting compounding materials. A new angle of attack on the problem of elimination of ozone cracking has been suggested, which may be productive of permanent relief. The necessity of further work along such lines, and the correlation of the results obtained by this method of aging and that occurring naturally is emphasized, and it is expected that this work will be continued and reported in the future.

Acknowledgement

The writer wishes to express his sincere thanks to E. W. Fuller for the kind interest and assistance extended during the preparation of this paper.

New Interest in Rubber Roadways

WITH rubber at the equivalent of just over 8 cents per pound in London, British industrialists are again considering the problem of its widespread application as road paving. Some time ago the rubber growers of Malaya and Ceylon offered the London County Council a continuous supply of rubber at a reasonable price for the construction of rubber roads. Nothing, however, happened in the matter of that particular offer.

Five types of rubber paving materials are now being tested on London roads at New Bridge Street; Little St. Andrew's Street, Holborn; Thurlow Place, Kensington; Southwark, Borough High Street, and at Acton.

Hitherto its cost has rendered it impracticable for general paving use. The experiment at Southwark, London, cost $20 per foot of road surface, although only a small percentage of that was for actual rubber. The big New Bridge Street section in central London has been down for four years, and is said to have stood the strain of heavy 24-hours-a-day traffic much more efficiently than wood blocks and concrete foundation.

Compression of Rubber* —Some Experimental Results

By F. JACOBS

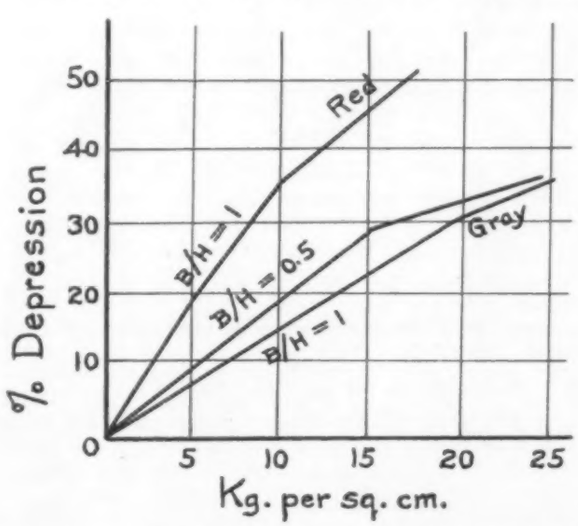
THE literature of rubber contains very little data on the compression of rubber. Paul Bary in his excellent work on rubber (forming part of his series *"Colloids in Industry"*), which appeared in 1923, reports a series of experiments by different investigators, but it would seem that the most complete information on the subject is that to be found in articles by Pierre Breuil which appeared in the *Le Caoutchouc et la Gutta-Percha* in 1905.

In the *India Rubber Journal* of Aug. 11, 1928, R. Ariano has reviewed the experiments of his predecessors and has also given some results obtained on molded cylinders, compressed along their axes of symmetry. The cylinders were compressed up to 45% of their height. These experiments were made on the type mixture: rubber—100; sulfur—8, and later in order to study the effect of the degree of vulcanization on a compound: rubber—100; sulfur—10; lime—2, with cures of 30, 40, 60 and 80 minutes at 3 kg. steam pressure.

We refer our readers to this article for the complete details which consider the mathematical expression of the results. We may remark that it indicates data on (1) the changes of volume observed, *i.e.*, the Joule effect—the volume at first increases during compression and then tends to diminish, which is the inverse of what happens during extension;—there is also at first heating and then cooling when the volume diminishes—; (2) the variation of the straight section—the straight section is such that its product with the height remains practically constant, the volume thus remaining constant—; (3) the coefficient of Poisson—this coefficient within experimental limits varied from 0.55 to 0.68 and was shown to be independent of the type of mixture;—(4) the energy absorbed in the deformation—a mathematical expression is given; and (5) the compression of unvulcanized rubber and the predominant influence of the temperature, as well as the duration of these tests.

We thought that the problem had not been settled and that it would be interesting to publish some practical results obtained with ordinary industrial mixtures.

We were personally obliged to make such a study some years



ago (1925-1926) because of the lack of precise data on the subject.

We must add, nevertheless, that M. Marcotte, director of the Experimental Laboratory of Bridges and Roadways, published in the *Génie Civil* of Dec. 7, 1929, some results of tests made by him on samples of which he indicates neither the composition nor the condition; information so published has nevertheless a certain interest and we refer our readers to it.

As far as we are concerned, we measured the compression of cubes of rubber (with a side of about 10 cm.) and also some half-cubes.

The results with the half cubes are expressed in the accompanying table (the cubes were compressed by two plates of a hydraulic press which registered at the same time both pressures and deformation in terms of the distance apart of the plates).

Load in kg.	Height in mm. *(residual)*	Compression mm.	Load per cc.	% Compression on	
				half-cube	whole-cube
0	98	0	0	0	0
250	88.5	9.5	5	9.5	7
500	79	19	10	19.2	15
750	70	28	15	28.5	23.5
1000	66	32	20	32.5	32

As soon as the load exceeded 750 kg., the test piece commenced to buckle, thus vitiating the results to some extent. It should be mentioned here that the percentages are practically equal when the ratio of the dimensions is

$$\frac{B}{H} = 1 \quad \text{or} \quad \frac{B}{H} = \tfrac{1}{2}$$

The tests were made on a black mixture of the solid tire type. Other similar tests were made on a red mixture whose quality was intermediate between that of ordinary red inner tubes and the firmer quality of red tires.

We should add that these mixtures were correctly vulcanized, though the red mixture was slightly undervulcanized.

The conditions of vulcanization are in fact essential if one wishes to carry out experiments on rubber, and such experiments have meaning and significance only if the vulcanization is correct. Moreover very often in practice if an article is bad or becomes bad it is necessary to look to vulcanization for the cause.

The samples manufactured in 1926 are still in an excellent condition.

The results of our tests can be summarized in the accompanying diagram.

*Translated from *Le Caoutchouc et la Gutta-Percha*, Volume 27, No. 317, pages 15087-8, July 15, 1930.

Z-88-P

THE Rubber Service Laboratories Company, Akron, O., have recently brought out accelerator Z-88-P, to replace their regular Z-88, which they have been manufacturing for a number of years. Z-88-P is an improved product over Z-88, in that it is a powder and can be handled very easily in view of its physical condition in weighing and milling operations. This change from lump to powder form has been made without affecting in any way the flat curing characteristics of the old Z-88. The new Z-88-P is claimed to be especially adaptable to use in white stocks and works well with organic colors.

EDITORIAL COMMENT

Sir Eric Throws a Bombshell

NO statement on the crude rubber situation for a long time has aroused more conflicting comment than Sir Eric Geddes' pronouncement, made before the stockholders' meeting of the Dunlop Rubber Company, when he said that the objective of all European producers should be to sell at a profit up to 17 cents per pound, below which price Asiatic production is discouraged.

This is decidedly a new note in the crude rubber drama from the recent despairing wails of anguish by the plantation interests as the recent market levels were falling.

In contrast to attempts to maintain prices at a level far above the production cost of the least efficient producers by curtailing production or restricting exports, the big European planters, Sir Eric indicates, should aim at a free market in which to set about cutting their production costs so low that they will have a profitable field at a comparatively narrow price range to themselves. Scientific management and large scale production are counted on to enable the European interests to make money on rubber at a price at which native growers cannot compete. Thus, the native production, which has thus far balked all attempts at curtailment, would automatically be greatly curtailed.

Incidentally, it is also interesting to note that Sir Eric now definitely attributes the great rise in Asiatic holdings to the enactment of the Stevenson Restriction Act, a statement that must be wormwood to the past protagonists of the scheme.

Sir Eric has a thorough appreciation of the value of silence, so that when he gives the world an opportunity to listen to his advice, that opportunity is never wasted.

As a member of the Cabinet, Sir Eric gained a great reputation. When he left office he was a very important figure in British public life. Had he so desired, he might have retained that position today. He might have been speaking at this hour on many subjects and saving Britain in many economic crises. For Sir Eric is a master economist. But like one or two other men whose services would be invaluable to any nation at the present moment, Sir Eric prefers to stick to his business.

He belongs essentially to the type of man of whom Swift made the king of Brobdingnag say: "Whoever can make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before deserves better of mankind and does more essential service to his country than the whole race of politicians put together."

Government Assistance—A Hope

TO meet demands of American trade and industries for constructive governmental assistance in eliminating avoidable waste in domestic merchandising, the Department of Commerce has announced a reorganization and expansion of its domestic trade services.

The plan of reorganization and enlargement which has now been worked out by Commerce Department officials in cooperation with representatives of manufacturers, distributors and consumers, proposes the creation of three new technical service units within the Bureau of Foreign and Domestic Commerce.

The new units have been designated as the Merchandising Research Division, the Domestic Regional Division and the Marketing Service Division. All the work undertaken by these three divisions will have the general object of promoting stability and reducing distributing costs. Individual projects will be conducted upon the specific request of trades and industries which can demonstrate both a vital need for such effort and inability to obtain the desired results otherwise.

Here, it would seem, is a possible chance for the rubber industry to obtain impartial outside assistance in solving some of its problems. It certainly needs all the assistance it can get. It has shown itself perfectly incapable of any sustained effort within itself, and the various agencies, which it has set up, have seemed to be equally impotent,—witness the Rubber Institute debacle. The rubber industry is too important to the country as a whole, as well as to its thousands of investors, to be allowed to get into a state of complete chaos and disruption, to say nothing of inevitable bankruptcy, a condition which looms menacingly, as present conditions in the merchandising of rubber products continue. At the moment, the industry needs to be saved from itself and maybe a government survey, with its resulting publicity, can do the trick.

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Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.

The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

AJAX RUBBER OFFICES SHIFTED TO CHARLOTTE

Completion of arrangements making Charlotte, N. C., executive as well as manufacturing center of the $15,000,000 annual business of the Ajax and McClaren Rubber Companies has been announced by officials of the McClaren Rubber Company here.

The company has leased offices on West Trade Street over the Union Bus Terminal and will remove its executive department from Racine, Wis., to this location, transacting all business here beginning October 1. Since June 1 the entire production has been handled in the Charlotte plant, while business continued to be carried on in executive offices in Racine.

Charles G. Miller, who has been in charge of the factory for the past six years, stated that the plant is running now at full capacity and is making 1,700 tires each day. It employs 450 men, working three shifts in some departments and as many as two in all departments.

BALDWIN RUBBER COMPANY WILL MAKE BRAKE LINING

The Baldwin Rubber Company, Pontiac, Mich., has announced plans to manufacture a molded brake lining which it will produce at the rate of 50,000 feet daily. A new plant addition has been built and machinery is now being installed, the start of operations being scheduled immediately on its readiness. The new lining was developed by engineers of the Baldwin company.

Among the chief products of the company at the present time are rubber automobile floor and running board mats and various mechanical rubber goods.

Columbian Carbon Expansion

Voting trust certificate holders of the Columbian Carbon Company, leading carbon black producer, will vote on a proposed increase in authorized capital stock from 500,000 shares to 2,000,000 shares. No immediate use of the additional stock is planned, but it is expected to be employed in strengthening the company's position in the natural gas industry.

The Dural Rubber Corporation, Flemington, N. J., is operating with a night shift. The company has doubled the production of automobile and swimming tubes. The concern will erect a one story addition to be used for the tube department.

Akron Rubber Men Are Listed in "Who's Who"

Two men associated with the rubber industry of Akron were added to those already listed in "Who's Who in America" in the recently issued 1930-31 volume. The distinction which was not accorded several of Ex-ambassador Gerard's list of American "rulers" was given to William F. O'Neil, chairman of the board of directors and president of the General Tire & Rubber Company, and to Congressman Francis Seiberling, attorney and a director of the Goodyear Tire & Rubber Company.

Among Akronites already listed among the more than 29,000 distinguished Americans in this biographical encyclopaedia are Harvey S. Firestone, president of the Firestone Tire & Rubber Company; Harvey S. Firestone, Jr., vice-president of the Firestone Plantations Company; F. A. Seiberling, president of the Seiberling Rubber Company; P. W. Litchfield, president of the Goodyear Tire & Rubber Company; J. D. Tew, president of the B. F. Goodrich Company; Jacob Pfeiffer, former president of the Miller Rubber Company; and C. B. Raymond, vice-president of the B. F. Goodrich Company.

DEDICATE AKRON SCHOOL TO GOODRICH'S MEMORY

Honoring the founder of the B. F. Goodrich Company, pioneer in the rubber industry, the Board of Education of Akron, next month will dedicate the city's most modern public school to the memory of the late Dr. Benjamin Franklin Goodrich. The dedication comes in the 60th anniversary of the founding of the Goodrich Company.

Dr. Goodrich was born in Ripley, N. Y., November 4, 1841, and died suddenly in Manitou Springs, Col., August 3, 1888.

He was educated privately until the age of 17, when he entered the Cleveland Medical College. He graduated from there in 1860 and practiced medicine in New York until the Civil War, when he enlisted as a physician.

Dr. Goodrich was interested in promotion of education, civic pride and employes' welfare.

STERLING TIRE COMPANY IS TO BE REORGANIZED

After having been in the hands of receivers for many months, the Sterling Tire Corporation, East Rutherford, N. J., is to be reorganized by its bondholders. It is understood that the new corporation will be known as the Sterling Company and that the new president of the firm will be Alex. A. Altschuler of Hackensack, with offices at 15 Exchange Place, Jersey City, N. J.

Early this year Otto Basten, as receiver, applied for permission to continue the business for a period for the benefit of creditors. At that time his intermediate report listed assets at $620,956 and liabilities at $1,166,338. The Sterling plant occupies a ten-acre site along the Erie Railroad and, according to the receiver, a conservative estimate of the real estate and buildings is $400,000. The company was established in 1917.

GOODRICH CONSTRUCTS LARGEST WIND TUNNEL

The largest and most complete wind tunnel of its kind in the United States has just been completed and added to the equipment of the aeronautic research department of the B. F. Goodrich Company, President J. D. Tew has announced.

The tunnel will be used to procure definite data concering various aeronautical appliances being developed by Goodrich. It is large enough for testing of full sized airplane wings.

Preliminary operation of the tunnel has been entirely successful. It was designed and constructed by the engineering department of the company. It is possible to control temperatures in the device.

Goodrich Opens Service Plant

A gala program marked the opening on August 9, at Akron, of the large service station of Goodrich Silvertown, Inc., the retail division of B. F. Goodrich Company. The new station is ultra-modern in design and is equipped with the last word in high-speed service equipment. Ten electrically operated gasoline pumps keep traffic moving rapidly through the station. The large parking area below the surface level permits of the handling of 50 cars at a time, while the service court on the upper level affords additional room for 40 more cars.

The new plant will serve as the Akron retail store for B. F. Goodrich Company.

GOODYEAR TO CONSTRUCT LARGEST BLIMP FOR NAVY

Construction of the envelope and control surfaces for the largest non-rigid airship in America has been started at the Goodyear Zeppelin Corporation factory, officials announced on September 11. The airship will be used by the United States Navy in experiments to determine the possibility of using fuel gas instead of gasoline as a source of motive power.

Two engines of 200 horsepower each will be used to drive the craft. They will be fed through fuel lines from a large bag within the envelope, in which the gas will be carried. Gasoline will be carried as a reserve fuel supply.

The envelope under construction is 220 feet long, 54 feet in diameter, and will contain 320,800 cubic feet of lifting gas. The car for the blimp, which will accommodate a crew of six men, is being built at the Naval Aircraft factory at Philadelphia.

When completed the new blimp will be nearly twice the size of the Defender, largest of the Goodyear non-rigid fleet, and one and one-half times the size of the Army and Navy "TC" and "J" type ships. It will attain a maximum speed of 58 miles per hour, engineers estimate.

FIRESTONE WILL OFFER NEW CHANGEOVER FELLOE

A new Firestone Universal Changeover Felloe for use in changing trucks now on solid or single pneumatic tires to dual pneumatics has been announced by the Firestone Steel Products Company.

The outstanding feature of this new felloe is its adaptability to any condition of load or service. This one felloe permits the use of any size tire from 5" high pressure to 11.25 balloons, no change being made in the wheel or spacer.

The Firestone "DTI," "R," and "BO" rims all fit on the standardized 28° mounting bevel of the Universal Felloe. The selection of the proper size and type of rim enables the operator to change from one size of tire to another or from high pressures to balloons to meet changing operating conditions.

KUNHARDT'S "FUTURE OF RUBBER"

COPIES of Lt.-Colonel J. C. G. Kunhardt's very interesting booklet on "The Future of Rubber," extensively reviewed recently both here and abroad, are now available in this country through THE RUBBER AGE. The booklet is published by the Rubber Shareholders Section of the Institution of the Rubber Industry, London, and is a comprehensive survey of present conditions surrounding the plantation industry and concludes with a broad and authoritative view of the possible situation in the future. The book is interesting reading for all those associated with the industry. Sent postpaid upon receipt of 65 cents (stamps or currency) by THE RUBBER AGE, 250 West 57th Street, New York City, N. Y.

William A. Robbins

William A. Robbins, superintendent of the Industrial Rubber Goods Company, St. Joseph, Mich., died on September 11 after an illness of six months. He had been associated with the rubber industry for many years.

Thomas S. Lindsey

Thomas S. Lindsey, vice-president and sales manager of the Kelly-Springfield Tire Company, died suddenly on the evening of September 15 while at the home of friends in New York City. His death was ascribed to a heart attack, following strain and overwork in recent weeks.

Born in Ohio on July 29, 1881, Mr. Lindsey began his business career with the

T. S. LINDSEY

Pennsylvania Railroad, but since that time his work has been mainly in the rubber industry. He was with the Diamond Rubber Company until about 18 years ago, when he joined the Kelly-Springfield organization as manager of the New York branch. He later took over sales activities and was promoted to the vice-presidency. As a member of the executive committee of the Tire Manufacturers' Division, he was active in the affairs of the Rubber Manufacturers' Association.

Funeral services were held at his home in Yonkers, N. Y., on September 16, with burial later at Alliance, O. Surviving are his wife, Mrs. Jessie Lindsey, and four children, Thomas, Jr., a student at the University of Pennsylvania; John, at Wesleyan University; Nancy, at Smith College, and Jean.

Charles R. Wolf

Charles R. Wolf, purchasing agent of the B. F. Goodrich Company for 32 years, died September 10 at his home in Akron, O. He was 60 years of age and had retired from active business four years ago.

A building permit for a one-story addition to its laboratory has been taken out by the Harshaw Chemical Company, Cleveland, O., and the company also has plans for a one-story unit for foundry service. Each of the two proposed structures will cost approximately $30,000, including equipment.

DAYTON RUBBER DENIES GENERAL MOTORS MERGER

John A. MacMillan, president of the Dayton Rubber Manufacturing Company, Dayton, O., has denied current rumors in business circles to the effect that his organization has been acquired by the General Motors Corporation. He stated, however, that for several years there has been a close relationship between Dayton Rubber and General Motors, the latter being interested in the production of rubber belts.

The Dayton Rubber Manufacturing Company has built a considerable business in the sale of these belts for automobiles and refrigerators, as well as for industrial purposes.

To Expand Pacific Goodrich

The Los Angeles factory of the B. F. Goodrich Company will be equipped with increased mechanical facilities for the manufacture of the new puncture-sealing inner tube developed by Goodrich engineers. The new equipment is to be installed immediately, according to F. E. Titus, general sales manager of the Pacific Goodrich Rubber Company.

Cyanamid Dividend Passed

Directors of the American Cyanamid Company this month omitted the quarterly dividends of 40 cents a share due at this time on the Class A and B common stocks. Omission of these disbursements is stated to be due to the widespread expansion of the company, coupled with the current depressed condition of business.

Rubber Stocks Action Mixed

At the end of the fortnight, Goodyear, Fisk and Firestone closed slightly higher, while Goodrich remained unchanged and U. S. Rubber dropped a trifle lower. New lows were made during the period by Goodyear and Kelly-Springfield common and by U. S., Firestone and Seiberling preferred. Closing prices on September 18 compare as follows:

	Last Price		—1930—	
	Sept. 18	Sept. 4	High	Low
Aetna	—	—	8⅛	5
Ajax	1	1	2½	1
Amer. Hard Rubber	—	—	81	50
Dayton "A"	—	—	8⅞	8¾
Falls	—	—	4¾	8
Faultless	—	—	37	33¾
Firestone	20¼	19⅝	33⅛	19⅝
do. 6% pfd.	69	72	87⅞	69
Fisk	2	1½	5⅛	1½
do. 1st pfd.	5½	—	21	5
General	—	—	163	130
do. pfd.	—	—	91	88
Goodrich	22¼	22¼	58½	21
do. pfd.	—	87	104½	78
Goodyear	53⅛	50¾	96⅞	50
do. 1st pfd.	93	94	102	90
India	11	—	25½	8½
Intercontinental	—	—	7⅛	2⅝
Kelly-Springfield	3¼	3¾	6⅛	1⅞
do. 6% pfd.	—	35	39	29
Lee	—	—	11	4⅝
Mohawk	8	9	16⅝	8
do. pfd.	—	—	55	15
Norwalk	—	—	4	⅞
Pirelli	—	39⅞	50⅞	39¾
Raybestos-Manhattan	29¼	31	58⅞	28
Seiberling	—	5¾	18½	5½
do. pfd.	—	—	78	34½
U. S. Rubber	18⅝	19	35	18¼
do. pfd.	36½	38¾	68⅞	36⅛

Names in the News

F. R. PURCHASE, who joined the Goodyear Tyre & Rubber Company organization at Wolverhampton, England, in 1928, has gone to Buenos Aires to take up a new position in the Goodyear factory now being constructed there.

E. H. NAHN, who has been representing the Naugatuck Chemical Company and the Rubber Regenerating Company in the Akron territory, including western New York and western Pennsylvania, had his territory increased this month to extend to Indiana, Michigan, Wisconsin and all western plants as far as Denver. Mr. Nahn is well known in this territory, having covered it several years.

R. C. TUCKER, vice-president and general sales manager of the western Firestone Tire & Rubber Company organization, has returned to the Los Angeles factory after a two-month absence.

T. G. GRAHAM, first vice-president of the B. F. Goodrich Company, has returned to Akron from a trip to Los Angeles, where he inspected the factory of the Pacific Goodrich Rubber Company and spent a week with the western sales force of the company.

HOWARD WRIGHT, who has been with the advertising department of the Firestone Tire & Rubber Company in several midwestern cities, will shortly be transferred to Cleveland, O., in the sales department of the company.

A. O. ZIMMERMAN, manager of the development department of the Goodyear Tyre & Rubber Company (Australia), Ltd., was the author of an interesting article on "Rubber Milling" in a recent issue of the *Australian Manufacturer*.

A. C. HARTMAN, formerly connected with the Firestone Tire & Rubber Company, was a visitor to Akron this month, together with Mrs. Hartman. He is now associated with the Gross Manufacturing Company, San Gabriel, Cal.

WILLIAM M. HUDSON, pilot of the Goodyear Tire & Rubber Company airplane, left Akron Airport on September 8 on a tour of five states which will take him until October 3 to complete. Directly thereafter, he will be sent to the west coast on a similar tour, and on both trips will make innumerable brake and airwheel test demonstrations.

C. W. REIS, manager of footwear sales, outlined the fall and winter sales program before the annual sales conference of a group of 20 salesmen representing the Buffalo district organization of the United States Rubber Company's footwear division. The meeting was held at the Buffalo Athletic Club, and other speakers included J. J. BRADY, special representative from the New York office of the company, and F. T. DUNSTAN, divisional manager of the Great Lakes district.

E. JOHNSON is now representing the Lima Cord Sole & Heel Company, Lima, O., in Canada, calling upon both manufacturers and retail merchants in connection with the firm's Gro-Cord soles and other items. Mr. Johnson has had practical shoe trade experience in both the retail and manufacturing branches.

WARD T. VAN ORMAN and ALAN MCCRACKEN, winning pilots of the Goodyear Tire & Rubber Company balloon in the recent international race, received official welcomes at both Cleveland and Akron on September 5 and were tendered a banquet at the Akron University Club on September 9. C. W. SEIBERLING, president of the Akron Chapter of the National Aeronautic Association and vice-president of the Seiberling Rubber Company, acted as toastmaster at the banquet.

F. A. SEIBERLING, president of the Seiberling Rubber Company, was honored at a formal luncheon gathering September 10 at the Portage Country Club, arranged by ELLWOOD RICE, head of the Rice Leaders of the World Association.

C. M. PIPER, general sales manager of the Fisk Rubber Company, has resigned from that organization, and his duties will be taken over by H. C. HANSON, manager of manufacturers' sales. Mr. Piper, who came to Fisk from the Goodyear Tire & Rubber Company two years ago, has made no announcement of his plans for the future.

C. C. SLUSSER, vice-president and factory manager of the Goodyear Tire & Rubber Company, spoke before the members of the Akron Real Estate Board at a luncheon meeting on September 8. His topic was "The Present Business Situation and the Outlook for the Future."

WILLIAM M. MCCONNELL, pilot of the trimotored plane of the Firestone Tire & Rubber Company, flew from Akron to Boston in three hours and 40 minutes early this month. He had seven passengers and his co-pilot, Edward J. Quigley, but made an average speed of 152 miles an hour, a record for speed for planes of the type.

FRED CLIMER will leave Akron on September 26 for Buenos Aires to become general superintendent of the new Goodyear Tire & Rubber Company tire factory there. He was tendered a farewell party on September 11 at the Goodyear dining hall.

LEO SCHOENHAIR, pilot of the "Miss Silvertown" plane of the B. F. Goodrich Company, experienced an accident in landing at Davenport, Ia., on September 13 that was close to being a serious crash. He was uninjured, however, and the plane was not badly damaged.

SENATORS ROSCOE MCCULLOCH and SIMEON D. FESS of Ohio, together with more than half of the representatives in Congress of that state, visited the Goodyear-Zeppelin Corporation hangar and planes on September 13. At a dinner to the Congressmen, P. W. LITCHFIELD, president of the Goodyear-Zeppelin Corporation and the Goodyear Tire and Rubber Company, spoke on the subject of lighter-than-air craft.

LEE S. WOODRUFF, general sales manager of the McClaren Rubber Company, who has been with that organization since its inception, has resigned to become vice-president and sales manager of the McClaren Tire Company, Los Angeles, Calif., distributors of McClaren tires in that city.

LEE R. JACKSON, vice-president in charge of sales of the Firestone Tire & Rubber Company, has returned to Akron after a two-month business trip throughout the west. He declared on his return that he was highly impressed with the business outlook in the western territory.

HERBERT W. MAXSON, of the B. F. Goodrich Company, and S. W. ANDERSON, of the Anderson Rubber Company, will act on the committee of the Akron Chamber of Commerce which will greet the 120 representatives of 21 nations visiting Akron next month as a part of an International Road Congress.

FREDERICK A. UPPERTON, who has been connected with the Firestone Tyre and Rubber Company, Ltd., for many years, returned recently from the Far East and will take over full supervision of Firestone sales at the head office at Brentford, England.

K. W. KERR, manager of footwear sales at St. Louis for the United States Rubber Company, has been promoted to the position of sales manager of the southern division of the footwear department.

CATALPO
for
Footwear

· Rubber News Around the World ·

CANADIAN I. T. S. COMPANY WILL ADOPT NEW NAME

The Viceroy Manufacturing Company, Ltd., has been organized to take over the entire business of the Canadian I. T. S. Rubber Company, Ltd., at Toronto, Ont. Originally incorporated in 1919, this manufacturer of heels, soles, molded goods and mechanical items, has increased the size of its business so steadily that a more flexible and larger capital structure was made necessary. A new incorporation was selected as the best way of bringing about the desired changes.

The new Viceroy company, it is stated, is about 90 per cent Canadian owned. There are planned no changes in management or personnel, while a larger program of production is scheduled.

MANUFACTURE OF TIRES IS STARTED IN POLAND

At the recent International Transportation Exhibition in Pozman, there was on display the first automobile tire to be manufactured in Poland. It was called the "Stomil" and was manufactured by the Centralna Poznanska Fabryka Wyrobo Gumowych Sp. Akc., of Poznan.

It is reported that agents are being appointed throughout the country. While not likely for several years at least to cut into American tire sales in Poland, even a small domestic production may be used later as pretext for a considerable increase in the import duty on tires.

British Goodyear Expands

A new two-story and basement building is to be added to the factory of the Goodyear Tyre & Rubber Company, Ltd., at Wolverhampton, England. The new addition will give the plant 33,600 square feet more floor space.

A Traffic Post That Bends

The city of Munich, Germany, is installing rubber mileposts and traffic signals of this type in order to eliminate the serious accidents that have occurred with posts of concrete or iron. The illustration shows clearly how flexible these new posts are.

Rubber Institution Meetings

Members of the West of England Section of the Institution of the Rubber Industry will meet at Trowbridge on October 1 to listen to a paper on "Rubber in the Sports Industry," by J. W. C. Ferrebe and F. L. White. On October 6, W. D. Owen will talk on "The Desirable Properties of Synthetic Compositions for Industrial Purposes" before the London and District Sections at the Theatre Club, London. The Scottish Section will meet October 8 at Glasgow to hear a paper by R. J. Noar on "The Industrial Applications of Sponge Rubber."

GOODYEAR OF CANADA PAYS EXTRA DIVIDEND

The Goodyear Tire & Rubber Company of Canada declared an extra dividend of $2.50, and regular quarterly dividends of $1.25 on the common and $1.75 on the preferred, all payable October 1 to stock of record September 15.

At this time last year the company declared an extra dividend of $5 on the common and in the fall of 1928 an extra dividend of $1 was declared.

In President C. H. Carlisle's summary of operating results for the first nine months of the current fiscal year, it was intimated that business has not been as large this year as last, but that sales should be regarded as satisfactory when compared with the available business. This is taken to mean that the company has been capturing more than its proportion of the trade that has developed in Canada.

While results of operations for the year which closes September 30th next are not expected to be equal to those of 1928-29, when nearly $22 a share was shown earned on common, and in 1927-28, when nearly $17 per share was earned, indications are that profits will be shown to have been on a scale well in excess of the dividends and bonus paid last year which amounted to $10 per share.

July Golf Ball Imports

Imports of golf balls into the United States during July numbered 222,788, valued at $72,212, as compared to June imports of 297,425 balls, worth $96,762, and imports in July, 1929, of 367,608 balls, valued at $120,853. The unit value per ball was 32.4 cents in July as compared to 32.5 cents in June and 32.5 cents in May.

British Footwear Exports

During the first six months of 1930, the United Kingdom exported 1,673,760 pairs of rubber boots and shoes and canvas rubber-soled shoes valued at £188,268. This compares with exports of 1,947,168 pairs, valued at £247,047 in the first half of 1929.

Mexican Tire Business Takes to Air

FOR the purpose of expediting contact with distributors in various parts of Mexico, the Mexican Trading Corporation, distributor of Firestone tires, has purchased this Spartan four-passenger cabin monoplane. It is said to be the first American plane bought in Mexico for exclusive commercial purposes. Carl B. Schmidt, president of the trading company, will fly the ship himself to visit his dealers.

CATALPO
for
Inner Tubes

Rubber Goods and Specialties

Hawk Basketball Shoe

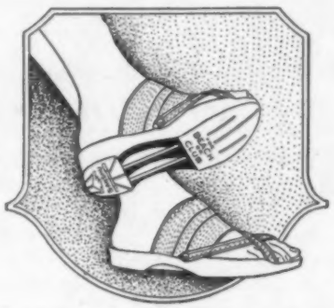
Two new basketball shoes, alike except for the soles, have been added to the line of the United States Rubber Company, 1790 Broadway, New York City, for distribution exclusively through sporting goods stores. The Falcon has a plain sole, while the Hawk, illustrated below, has a molded sole

of special design, with a pivot pad under the ball to aid in quick, easy turning. The most important feature of the construction, according to the manufacturer, is a new orthopedic last, with a narrow shank, narrow heel, and an orthopedic swing to the forepart of the shoe. It has a felt-lined, shaped tongue.

Dura Rumble Seat Slicker

Protection for the rumble seat occupants in the event of a sudden shower is provided by the Dura Rumble Seat Slicker, now being offered by the Dura-Products Manufacturing Company, Canton, O. Made of specially constructed rubberized fabric, this device fastens to the body of the car with sponge rubber cleats. It can be installed in three minutes and completely protects the riders

of the exposed seat. The slicker, which fits all cars, folds up into a neat bag only nine by twelve inches in size. The rubberized fabric construction is such that it will not crack in cold weather and can be washed with sponge, soap and warm water. Red, blue, green or black are the colors in which the slicker can be furnished.



Sanshu Sponge Rubber Sandal

For use in walking to and from the pool and beach, the Judsen Rubber Works, 4101 West Kinzie street, Chicago, Ill., is offering a new sandal under the name of Sanshu. The soft buoyant sponge rubber soles provide comfort and safety in walking over sharp-stoned beach approaches, hot sands and cold concrete floors. They also offer protection against foot infections. There are no buckles or laces and no place for sand to lodge in these sandals. The manufacturer is making them in all sizes in red and green and is reporting a steadily increasing business from clubs, schools, and also from such organizations as the Y. M. C. A.

British Rubber Novelties

A waterproof shampoo cape and an artistic linen bag are among the latest rubberware novelties being featured by London retailers. The shampoo cape is slipped over the head and hangs round the shoulders, protecting the wearer's dress or suit from wetting while enjoying a shampoo. It is made of rubber material printed with a pleasing floral design, and fits so snugly to the neck that no trickles can make their way inside. The cape is about 14 inches deep and retails for about 60 cents.

The linen bag is made of rubber with a cretonne design outside. The laundry is pushed through a hole cut out near the top, and when the bag is emptied there is a neat flap which unbuttons at the end, and the soiled linen drops out. A coat hanger is inserted in the top, so that the bag can be easily hung up in the wardrobe. The bag is made in all colors and a variety of designs and is being retailed for the equivalent of 75 cents.

Automobile Fabric Print

An innovation in decking for automobiles is the printing of grain effects on Fabrikoid to simulate a woven fabric, according to E. I. du Pont de Nemours & Company. The new development is said to meet the rigid requirements of a collapsible top, and the surface is coated with an especially prepared pyroxylin film. It is available in beige tones and is a double texture fabric, the combining medium being vulcanized rubber cement.

Gripsure Basketball Shoe

The Top Notch Gripsure DeLuxe is the newest addition to the basketball shoe line of the Beacon Falls Rubber Company, Beacon Falls, Conn. Its specially designed foot-conforming last is built on new principles that provide firm support to the arch, give comfort and help to develop greater

speed. The sole design is the Gripsure patented construction which prevents slipping. Among its features are its extra long and thick sponge cushion, four-ply arch support, comfortable sox lining, korxole insole, full shape back stay, vertical bar toe bumper guard, and double toe cap. The basket-weave boxing gives it a very distinctive appearance.

Rubber Checks

"Rubber checks" have for many years in slang parlance denoted checks that "bounced back" or failed to collect their face value at the bank on which they were drawn. The Seiberling Rubber Company, however, recently sent out actual rubber checks to its dealers as an advertising novelty. The standard size and typography were used on a sheet of light white rubber.

Oak Radiant Balloon

A design on the order of the conventional lotus blossom has been chosen by the Oak Rubber Company, Ravenna, O., for its newest decorated balloon. Eight elongated petal-like stripes extend down from the top

centre of the balloon and curve gracefully down the side. These stripes are printed in two and three colors on balloons of various bright hues, the contrast of color producing a very attractive effect. This new series is being marketed by the company under the name of Radiant balloons.

Current Crude Rubber Items

BUCHANAN IS EXPELLED FROM RUBBER EXCHANGE

The expulsion of James Buchanan from the Rubber Exchange of New York was announced from the rostrum on September 9 by President F. R. Henderson. Mr. Buchanan, who had been a member of the Exchange since 1926, was expelled for violating section 52, sub-divisions (A) and (E) of the by-laws and commission law rule No. 4. Mr. Henderson made the following statement in connection with the expulsion:

"In 1926, Buchanan made an applicatonn to the Exchange on behalf of James Buchanan, Inc., for corporation privileges. In said application, Buchanan made certain misrepresentations in regard to the stockholdings in said corporation.

"Some two years thereafter there was a change in the officers and stockholdings of said corporation. The form of application for corporation privileges on the Rubber Exchange specifically provides that in the event there is any change in the personnel of the officers, directors or stockholdings of a corporation enjoying corporation privileges, notice thereof must be filed with the Exchange.

"Buchanan failed to file notice with the Exchange in accordance with said provision. The action of the Board of Governors (in expelling Buchanan) was taken on the report of the Supervisory Committee, which conducted an exhaustive investigation of the matter."

Several months ago, the failure of James Buchanan, Inc., was announced on the Exchange.

Gross September exports from Malaya will approximate 46,000 to 47,000 tons, according to estimates cabled to members of the Rubber Exchange. August exports were 47,802 tons.

Eastern Governments Decide Against Rubber Restrictions

DESPITE the fall in rubber plantation company shares estimated at $600,000,000 and the fact that the price of rubber is now below production cost, the governments of the Dutch East Indies and the Straits Settlements have decided against any restrictive measures, preferring to let economic laws take their course. The Governor of the Straits Settlements, Sir Cecil Clementi, visited the Governor-General of the Dutch East Indies late last month. Earlier this month the government of the Straits Settlements, in an explanatory letter to the Malayan rubber industry, stated that the Governor-General of the Dutch East Indies, in the interview with Sir Cecil, declared that:

(1) While amelioration of rubber prices was of great importance to European plantations, it was, as regards the indigenous population, desirable only with a view to general economic conditions.

Native Gardens Now Idle

(2) The native rubber gardens were not tapping at present, and restriction by Europeans, if successful, would increase prices to a level reasonably profitable for those plantations and result in a considerable increase in native production, thereby seriously counteracting and perhaps nullifying the restriction.

Voluntary native co-operation in the Dutch East Indies could not be expected, continued the Governor-General, and there was the following strong objection against forcible intervention by the Dutch authorities:—

(1) It was the aim of the Dutch Government to apply as little compulsion as possible towards the native population, which had not asked for restriction. There was even propaganda being made by them against such action.

(2) Those planters owning a limited number of trees yielding a small additional daily income, and those who were entirely dependent upon their income from rubber trees would be harmed by restriction and would not be much impressed by the possibility of future compensation for such immediate damage.

(3) Application of restriction of native production was most difficult, and scarcely possible because there was hardly any land registration. For this reason the Stevenson scheme was impracticable for native producers.

Regulation of production by checking of exports, continued the Governor-General, would bring about large stocks and have a most undesirable influence on home prices. Increase of the export duty might be successful, but would weigh heavily upon the small owners. The cessation of tapping for a few days in the week would be practicable only with native co-operation, but would be less successful than might seem probable at first sight because at present already in many regions tapping was done in a most irregular manner, and because of the technical difficulty that increased production on tapping days would outweigh the decrease in production on days when there was no tapping.

Dutch Fear Tariff Reprisals

(4) There was an international objection, namely, the possibility that countries consuming rubber might, as a reprisal, increase their import duties on products from the Dutch East Indies.

The letter of the Straits Government therefore states that intervention by the Dutch authorities is not to be expected at present, and continues, after pointing out that the industry has never yet had a normal period:

"What is now needed is that prices be stabilized by the action of the economic laws. The Governor, advised by the Executive Council, considers that unilateral action in this peninsula would be worse than useless, and has therefore decided that economic laws be allowed to take their course in the hope by this means stabilization of prices will be realized, and the industry then enter upon a normal period in which supply and demand approximately balance each other."

Ceylon shipments of crude rubber during August totaled 6,701 tons, as compared with 4,070 tons in the previous month.

Closing Prices on Rubber Exchange of New York, Inc.

FROM SEPTEMBER 4 TO SEPTEMBER 18, 1930

		Spot	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sales
No. 1 Standard Contract of 10 Tons															
Sept.	4	9.25	9.18	9.30	9.41	9.52	9.68	9.82	9.99	10.09	10.19	10.34	10.50	10.65	17
	5	8.93	8.92	9.03	9.13	9.24	9.39	9.53	9.68	9.79	9.90	10.01	10.12	10.23	73
	6	8.56	8.40	8.40	8.50	8.60	8.76	8.92	9.08	9.24	9.40	9.59	9.78	9.94	42
	8	8.12	8.10	8.10	8.20	8.30	8.45	8.59	8.73	8.95	9.15	9.30	9.45	9.60	140
	9	8.06	8.00	8.00	8.10	8.21	8.36	8.50	8.65	8.79	8.94	9.07	9.20	9.32	54
	10	8.00	8.00	8.00	8.10	8.20	8.34	8.48	8.62	8.79	8.91	9.03	9.14	9.30	22
	11	8.25	8.25	8.25	8.36	8.48	8.62	8.76	8.90	9.03	9.15	9.28	9.40	9.50	60
	12	8.12	8.10	8.10	8.20	8.28	8.42	8.55	8.68	8.81	8.94	9.07	9.20	9.32	26
	13	8.06	8.00	8.00	8.12	8.24	8.34	8.44	8.55	8.66	8.80	8.95	9.10	9.20	14
	15	8.08	8.00	8.09	8.17	8.25	8.45	8.56	8.67	8.78	8.88	9.00	9.12	9.24	77
	16	8.25	8.05	8.16	8.27	8.38	8.56	8.68	8.80	8.89	8.98	9.09	9.20	9.32	35
	17	8.18	8.06	8.10	8.22	8.36	8.55	8.67	8.78	8.88	8.98	9.08	9.17	9.35	47
	18	8.18	8.06	8.15	8.25	8.36	8.55	8.67	8.78	8.89	9.00	9.12	9.22	9.40	16
"A" Contract of 2½ Tons															
Sept.	4	——	9.10	9.20	9.30	9.40	9.60	9.70	9.90	10.00	10.10	10.20	10.40	10.50	58
	5	——	8.80	8.90	9.00	9.10	9.30	9.40	9.50	9.60	9.80	9.90	10.00	10.10	265
	6	——	8.30	8.30	8.40	8.50	8.70	8.80	9.00	9.10	9.30	9.40	9.60	9.80	62
	8	——	8.00	8.00	8.10	8.20	8.40	8.50	8.60	8.80	9.00	9.10	9.30	9.50	536
	9	——	7.90	7.90	8.00	8.10	8.20	8.30	8.50	8.60	8.70	8.90	9.10	9.20	631
	10	——	7.90	7.90	8.00	8.10	8.30	8.40	8.50	8.60	8.80	8.90	9.00	9.20	324
	11	——	8.10	8.20	8.30	8.40	8.50	8.60	8.80	8.90	9.10	9.20	9.30	9.40	347
	12	——	8.00	8.00	8.10	8.20	8.30	8.40	8.50	8.60	8.80	8.90	9.00	9.20	155
	13	——	7.90	7.90	8.00	8.10	8.20	8.30	8.40	8.50	8.70	8.80	8.90	9.10	96
	15	——	7.90	8.00	8.10	8.20	8.40	8.50	8.60	8.70	8.80	8.90	9.00	9.20	121
	16	——	8.00	8.10	8.20	8.30	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.20	19
	17	——	8.00	8.00	8.10	8.30	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.30	117
	18	——	8.00	8.10	8.20	8.30	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.30	63

FIRESTONE FIGURES SHOW TIRE-MILE COST DECLINE

Figures of the Firestone Tire & Rubber Company showing tire-mile cost sharp decreases over a period of years, show that the rubber industry has made engineering and distribution progress hard to duplicate in the manufacturing field.

When the recent price and product revisions were announced with the new tire lines of increased quality, it was shown that tires give far more mileage and cost much less than they did five years ago.

The Firestone figures show a decrease of 37 per cent from the period of 1928-1929 to 1930-1931 in tire-mile costs.

In the period from 1910 to 1912, the tire-mile cost was estimated at $0.0112 or more than a cent a mile. From 1919-1921, the cost went down to $0.0030, more than 3 miles for a cent, and in 1930, the cost went as low as $0.000767, about 15 miles for a cent, or one-fifteenth of the cost in 1910-12.

The Firestone engineers attribute recent tire-mile cost reductions to the increased mileage afforded by the patented "double cord breaker," which is in effect the addition of two plies of gum-dipped cords under the tread, and obviously gives greater mileage and brings greater freedom from road troubles and consequent reduction of tire-mile cost.

R & H CHEMICAL COMPANY NAMES TECHNICAL MEN

The Roessler & Hasslacher Chemical Company has announced the appointment of the following men to its technical staff at Niagara Falls:

E. B. Bloom, formerly instructor of chemistry at Lehigh University; A. G. Cole, since 1928 teaching fellow at the State College of Washington; R. W. Currie and H. E. Wagoner, 1930 graduates of Indiana University; Wm. F. Geigle, a 1930 graduate of Cornell University; H. S. Greene, who received his Ph.D. from the University of Cincinnati in June, 1930; O. B. Hodges, Alabama Polytechnic, 1923; R. E. Hulse, Ph.D., Cornell University, 1930; J. H. Payne, Ph.D., University of Cincinnati, June, 1930; and T. E. Thompson, M.E., Cornell University, June, 1930.

PATENTS ARE GRANTED TO AKRON RUBBER MEN

Patents were granted to four Akron men early this month on inventions relating to the rubber industry.

W. F. Koleta was awarded a patent on tire building apparatus, his application having been filed May 17, 1929. Walter A. Kline was given a patent on inner tube construction and rights have been assigned to the A-R Products Corporation. A patent granted to R. H. Reiter for a liquid level operated rheostat has been assigned to the Cleveland Trust Company.

A process of coloring rubber articles has been patented by Arthur P. Whitten, and rights to the process have been assigned to George E. Hall.

Industrial Salvage Conference

A session of the Salvage and Reclamation Division of the National Association of Waste Material Dealers, Inc., was held at the Clifton Hotel, Niagara Falls, Can., on September 22 and 23.

Columbian Carbon Earnings

The Columbian Carbon Company, producer of carbon black, has reported net earnings for the six months ended June 30, 1930, of $1,593,180, equal to $3.19 a share on the common stock. In the first half of 1929, the company earned $2,085,590, or $4.57 a common share.

Worker Sues Goodrich

Paul Poore, of Akron, O., former employe of the B. F. Goodrich Company, has filed a suit for $100,000 against the rubber company, charging that the work at which he was employed was responsible for his present tubercular condition. According to his petition, he was employed using sand blasting equipment on metal tanks from October, 1928, to July, 1930.

Government Specification

The Federal Specification Board is submitting to representative manufacturers a proposed revision of the federal specification for rubber ring cushions. The board will send copies of this specification to any firm interested and will be glad to receive any comment or suggestions as to changes which may be thought desirable. These comments should be sent to reach the board by October 6 to receive attention from the technical committee considering the subject.

Rubber Section, N. S. C.

As previously announced, the Rubber Section of the National Safety Council will begin its sessions at the annual Safety Congress on September 30 in the Fort Pitt Hotel, Pittsburgh, Pa., continuing until October 2. The full program was printed on Page 585 of the September 10 issue of THE RUBBER AGE. Other sessions which will be of particular interest to rubber factory men will be those of the Chemical Section, Education Section, Employes' Publication Section, Fire Prevention Session, Industrial Health, Industrial Nursing and the Statistics Section.

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WANTED—Experienced factory superintendent for central European plant. Must have thorough knowledge of footwear, heels and compounds. Address Box 572, THE RUBBER AGE.

WANTED—Representative in New England Territory for a small Ohio Rubber Factory to sell on commission. This company has been in business over 12 years, and is financially sound. They make hard and soft rubber parts for a number of nationally known manufacturers. No objections to representative selling non-conflicting lines. Give age, experience and references. Address: Ohio Rubber Manufacturer, Box 569, THE RUBBER AGE.

BUSINESS OPPORTUNITIES

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LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, SEPTEMBER 19, 1930

RUBBER

Crude

CRUDE rubber established a new low closing price on the New York outside market on September 19 at 8 cents a pound. At the same time the London market sagged below 4 pence, and the futures market on the New York Rubber Exchange shared in the general weakness without actually recording new low levels for sales.

The explanation for the final decline after a fortnight of low quotations is that stocks of crude rubber in the Eastern producing regions are steadily mounting. Small estates showed the largest gains in output last month. Production of estates of 100 acres or less was 22,307 tons against 18,104 tons in July. Larger estates reported output of 23,796 tons against 22,704 tons in July. Stocks on the larger estates totaled 26,430 tons on August 31, compared with 25,814 tons on July 31.

The original drop in price of a cent or more earlier in the fortnight was due, of course, to the announcement that the governments of the Dutch East Indies and the Straits Settlements would take no official action toward restriction.

Prices quoted on the New York outside market on September 19 were as follows:

Plantations—

Ribbed Smoked Sheets—			
Spot-Sept.	.07⅞	@	.08
October	.08	@	.08¼
Nov.-Jan.	.08⅛	@	.08⅜
First Latex, crepe spot	.08	@	.08¼
Amber Crepe, No. 2	.07½	@	.07⅝
Amber Crepe, No. 3	.07⅜	@	.07½
Amber Crepe, No. 4	.07⅛	@	.07⅜
Brown Crepe, Clean thin	.07¼	@	.07⅜
Brown Crepe, specky	.06⅞	@	.07⅛
Liquid Latex, per gal.	.75	@	.85

Paras—

Up-river Fine	.12¼	@	.12½
Up-river Medium	Nominal		
Up-river Coarse	.06½	@	—
Acre Bolivian, fine	.12¼	@	.12½
Caucho Ball, Upper	.06	@	—
Islands, fine	Nominal		

Centrals—

Central, scrap	—	@	.06
Esmeraldas	—	@	.06

Balata—

Block, Colombia	Nominal		
Block, Ciudad	.41	@	.42

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-September	4d	@	—
October	4d	@	—
October-December	4d	@	4⅛d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot	3⅝d	@	—

Scrap

With reclaim production and prices down to new low levels, the scrap market is temporarily demoralized. Collections have been greatly curtailed, although next month is expected to bring an appreciable increase in the output of reclaim. Late quotations are as follows:

(Prices to Consumer)

Auto tire peelings	ton	23.50	@	25.00
Mixed auto	ton	12.00	@	12.50
Bicycle tires	ton	9.00	@	10.00
Clean solid truck tires	ton	24.50	@	26.00
Boots and shoes	cwt.	1.10	@	1.25
Arctics, untrimmed	cwt.	.90	@	1.00
Inner tubes, No. 1	lb.	.05¼	@	.05½
Inner tubes, No. 2, compounded	lb.	.02¼	@	.02¼
Inner Tubes, Red	lb.	.02¼	@	.02⅝
Air Brake Hose	ton	10.00	@	12.00
Rubber Hose	ton	9.00	@	10.00

Reclaimed

Stocks of reclaimed rubber are at the lowest point in many months, but reclaimers are making no effort to increase them further at the present time. Reclaim production in July and August was far below normal, and the proportion of reclaim consumed in relation to crude rubber the lowest in years. The latest price quotations for the various grades of reclaim are as follows:

High Tensile

Super-Reclaim Black	lb.	.08½	@	.08¾
High Tensile Red	lb.	.08¼	@	.08½

Shoe

Unwashed	lb.	.06	@	.06¼
Washed	lb.	.08	@	.08¼

Tube

No. 1 (Floating)	lb.	.08½	@	.08¾
No. 2 (Compounded)	lb.	.07½	@	.07¾

Tires

Black	lb.	.05¾	@	.06
Black, selected tires	lb.	.06	@	.06½
Dark Gray	lb.	.07	@	.07½
Light Gray	lb.	.07¾	@	.08
White	lb.	.08¾	@	.09
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½

Miscellaneous

Mechanical blends	lb.	.05	@	.05½

COTTON and FABRICS

Cotton

TOUCHING a new low level of 10.90 cents a pound on September 19, spot cotton reflected the expectations for a heavy crop, the large carryover, and the unsettled conditions throughout the textile industry. No immediate developments seem to promise an upward trend in price.

While domestic sales of cotton goods are running slightly ahead of production, stocks of finished merchandise on hand at the end of last month were double the amount of unfilled orders. Domestic mills consumed 352,335 bales in August against 558,754 in the same month of 1929. Meanwhile, the situation in the United Kingdom, Europe and India shows little improvement, and even France is finding some curtailment necessary.

The high, low and closing prices on the New York Cotton Exchange on September 19 were as follows:

	High	Low	Close	Close
		Sept. 19		Sept. 4
Oct.	10.91	10.82	10.82	11.17
Dec.	11.12	11.00	11.01	11.36
Jan.	11.20	11.10	11.10	11.46

Tire Fabrics

Tire factories used 17,865,852 pounds of cotton fabric during the month of August, a sharp reduction from the rate of a year ago. Prices, which were slightly easier in sympathy with the quotations for the raw commodity, closed as follows:

CORD

Peeler, carded, 23/5/3	lb.	.37½	@	.38
Peeler, carded, 23/4/3	lb.	.39½	@	.40
Peeler, carded, 13/3/3	lb.	.35	@	.35½
Peeler, carded, 15/3/3	lb.	.35½	@	.36
Egyptian, carded, 23/5/3	lb.	.48¼	@	.48¾
Egyptian, combed, 23/5/3	lb.	.54	@	.55¾

CHAFERS

Carded, American, 8 oz.	lb.	.33	@	.34
Carded, American, 10 oz.	lb.	.32½	@	.33
Carded, American, 12 oz.	lb.	.31	@	.32
Carded, American, 14 oz.	lb.	.30	@	.31

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.34	@	.37½
Carded, American, 10¼ oz.	lb.	.34	@	.37½

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.38	@	.38½
Carded, American, 17¼ oz. 10-ply	lb.	.30½	@	.31½

Sheetings

Except for fractional reductions in two sizes, the market for sheetings closed the fortnight unchanged. Prices, as reported by the Textile Brokers Association, follow:

40-inch, 2.50-yard	yd.	—	@	.08½
40-inch, 2.85-yard	yd.	.07½	@	.07¾
40-inch, 3.15-yard	yd.	—	@	.09
40-inch, 3.60-yard	yd.	—	@	.07¼
40-inch, 3.75-yard	yd.	—	@	.06¼
40-inch, 4.25-yard	yd.	—	@	.05¼

Ducks

Demand for cotton ducks has continued light, but the price structure has remained unchanged. Current price quotations for the various grades remain as follows:

Belting and Hose	lb.	.29	@	.30
Enameling	lb.	.28	@	.31
Single filling	lb.	.13¼	@	.13½
Double filling	lb.	.14	@	.15

CHEMICALS

WITH the poorest months of the year as regards the sale and consumption of chemical supplies in rubber plants out of the way, manufacturers and suppliers of these chemicals and compounding ingredients may now look forward to busier days. The inventory situation in tire factories is the best in two years, and production is about to be resumed at more nearly normal rates. Some plants have already announced their intention of increasing output, and others are expected to follow. The prices of the major items among rubber chemicals and compounding materials have remained firm, but a few softeners have shown declines during the fortnight.

ACCELERATORS

Organic			
A-1	lb.	.24 @	.27
A-5-10	lb.	.33 @	.36
A-7	lb.	.55 @	.59
A-11	lb.	.62 @	.66
A-16	lb.	.57 @	.61
A-19	lb.	.58 @	.62
A-20	lb.	.64 @	.68
A-32	lb.	.90 @	.95
Aldehyde ammonia, crystals	lb.	.65 @	.70
Aniline oil, drums, f.o.b. works	lb.	.15 @	.16
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.42 @	.44½
Diphenylguanidine	lb.	.30 @	.32½
Dipsol	lb.	4.30 @	4.50
Ethylidene aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½@	.40
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.58½@	.61
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.37½@	.40
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.75 @	—
R & H 40	lb.	.40 @	.42½
R & H 50	lb.	.40 @	.42½
R & H 897	lb.	.75 @	.77½
R-2	lb.	1.95 @	2.15
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Tensilac, No. 39	lb.	.40 @	.42½
Tensilac, No. 41	lb.	.50 @	.52½
Thermlo F	lb.	.50 @	.55
Thiocarbanilid, drums	lb.	.25½@	.28½
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.62½
Tuads	lb.		
Ureka	lb.	.75 @	1.00
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.50 @	.60
Zimate	lb.		
Inorganic			
Lead, sublimed blue	lb.	.08¼@	—
Lead, white	lb.	.08¼@	.08¾
Litharge, domestic	lb.	.07¾@	—
Magnesia, calcined, light	per 100 lb.	5.35 @	5.45
heavy	per 100 lb.	3.65 @	3.75

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.35 @	.36
Ultramarine	lb.	.06 @	.32
Browns			
Sienna, Italian	lb.	.05¼@	.12½
Umber, Turkey	lb.	.04½@	.07
Greens			
Chrome, light	lb.	.30 @	.32
medium	lb.	.31 @	.33
dark	lb.	.34 @	.36
Chromium Oxide, bbl.	lb	34½@	.35½
Reds			
Antimony crimson, 15/17	lb.	.40 @	.44
sulfur, free	lb.	.56 @	.66
golden 15/17 F.S.	lb.	.20 @	.25
Indian English	lb.	.08 @	.11
Domestic (Maroon)	lb.	.11 @	—
Oximony	lb.	.13¼@	—
Red oxide pure	lb.	.10 @	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾@	.10
Rub-Er-Red, f.o.b. Easton	lb.	.08¾@	—
Venetian red	lb.	.03 @	.06
Vermillion, quicksilver, English	lb.	1.75 @	1.80
Whites			
Lithopone, Akcolith	lb.	.05 3/5@	.06
Lithopone, Albalith	lb.	.05¼@	.05¾
Lithopone, Azolith	lb.	.05¼@	.05¾
Lithopone, Vanolith	lb.	.05¾@	—
Titanox B, f.o.b. St. Louis,	lb.	.07¼@	.07¾
Titanox C, f.o.b. St. Louis,	lb.	.07¾@	.08¼
Zinc Oxide—American Process			
American Azo:			
ZZZ (lead free)	lb.	.06½@	.07
ZZ (leaded)	lb.	.06⅝@	.06⅞
Horsehead Brand:			
Special	lb.	.07 @	.07½
XX Green	lb.	.07 @	.07½
XX Red, lead free	lb.	.06½@	.07
Kadox, black label	lb.	.10⅝@	.10⅞
blue label	lb.	.09⅝@	.09⅞
red label	lb.	.08 @	.08½
Zinc Oxide—French Process			
White seal	lb.	.11⅝@	.11⅞
Green seal	lb.	.10⅝@	.10⅞
Red seal	lb.	.09⅝@	.09⅞
Yellows			
Chrome	lb.	.17 @	.17½
Ocher, French medium	lb.	.02 @	.03
domestic	lb.	.01⅝@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85 @	24.50
Ammonia carbonate, lump	lb.	.07½@	.07¾
Asbestine	ton	14.75 @	18.00
Barium carbonate	lb.	.03½@	.05
Barium Dust	lb.	.05 @	.06
Barytes southern off-color	ton	12.00 @	18.00
Western prime white	ton	23.00 @	—
imported	ton	27.00 @	36.00
Basofor	lb.	.04½@	—
Bentonite	lb.	.02 @	.03
Blacks			
Arrow "Aerfloted"	lb.	.05 @	.10
Bone Black	lb.	.06 @	.12½
Carbon, compressed	lb.	.04½@	.09
Carbon, uncompressed	lb.	.04½@	.09
Disperso, f.o.b. Louisiana	lb.	.046 @	—
Disperso, f.o.b. Texas	lb.	.04½@	—
Drop Black	lb.	.06 @	.14
Fumonex	lb.	.04 @	.08
Excello, compressed	lb.	.05 @	.09
Gastex, f.o.b. Texas	lb.	.04 @	.05¼
Lamp Black	lb.	.10 @	.40
Micronex	lb.	.05 @	.10
Thermatomic-Thermax	lb.		
Flex	lb.		
P-33	lb.		
United carbon, fob Tex.	lb.	.04½@	.09½
Velvetex carbon	lb.	.03 @	.06
Blanc fixe dry f.o.b. works	ton	75.00 @	90.00
Carrara filler	lb.	.01¾@	.02
Catalpo (fact.)	lb.	.02 @	—
Clay, Kaolin, domestic	ton	8.00 @	9.00
Aerfloted, Suprex	ton	10.00 @	22.00
Colloidal	lb.	.05 @	.08
Congaree, c. l. f.o.b. mine	ton	9.00 @	—
Dark Blue Ridge	ton		
Dixie	ton		
Langford	ton		
Lexington	ton	10.00 @	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00 @	23.00
Par	ton		
Tensulite		15.00 @	—
Glues, extra white	lb.	.22 @	.26
medium white	lb.	.20 @	.24
Magnesia, carbonate	lb.	.08¾@	.11
Mica, white water grnd.	lb.	.06 @	.08
Off color (biotite)	lb.	.05 @	.07
Rotten Stone (powdered)	lb.	.02 @	.05
Soapstone, powdered	ton	15.00 @	22.00
Starch, powdered	cwt.	3.62 @	3.92
Talc, domestic	ton	12.00 @	15.00
Pyrax A	ton		
Whiting, commercial	cwt.	— @	1.00
English cliffstone	cwt.	1.75 @	2.00
Quaker	ton		
Superfine	ton	10.00 @	12.00
Sussex	ton		
Witco	ton	20.00 @	—
Zinc Carbonate	lb.	.09½@	.10½
Zinc Stearate	lb.	.23 @	.24½

MINERAL RUBBER

Genasco (factory)	ton	50.00 @	52.00
Granulated M. R.	ton		
Hard Hydrocarbon	ton		
Paradura	ton	62.50 @	65.00
Parmr, solid	ton	28.00 @	48.00
Pioneer, MR, solid	ton	40.00 @	42.00
Pioneer-granulated	ton	50.00 @	52.00
R & H Hydro-Carbon	ton	27.95 @	29.00
Robertson, MR, solid	ton	34.00 @	80.00
M.R. (gran)	ton	38.00 @	80.00

SOFTENERS

Acids			
Nitric, 36 degrees	cwt.	5.00 @	5.25
Sulfuric, 66°	cwt.	1.60 @	1.95
Tartaric, crystals	lb.	.34½@	.36
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.13 @	.17
Stearic, double pressed	lb.	.17 @	.22
Alkalies			
Caustic soda, 76%	cwt.	3.76 @	3.91
Soda ash, 58% C.L.	cwt.	1.40 @	
Oils			
Corn, refined, bbls.	lb.	.08 @	.09¾
Cottonseed, crude	lb.	.07 @	.07¼
Cycline	gal.	.27 @	.34
Degras (c.l. 100 bbls.)	lb.	.03¾@	—
Less c.l. (10-25 bbls.)	lb.	.04 @	—
Lots less than 10 bbls.	lb.	.04¼@	.04½
Fluxrite	lb.	.05½@	.06¼
Palm Lagos	lb.	— @	.07
Niger	lb.	.05¼@	.05¼
Para-Flux	gal.	.17 @	—
Petrolatum, white	lb.	.08 @	.08½
Pigmentaroil	gal.	.15 @	.20
Pine, steam distilled	gal.	.65 @	.70
destructively distilled	gal.	.50 @	.55
Witco Palm Oil	lb.	.11 @	—
Witco Softener (f.o.b. wks.)	lb.	.02 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06½@	.07½
coal tar	gal.	.05½@	.06
pine, 200 lb. gr. wt.	bbl.	7.00 @	—
Rosin, grade K, 280 lb.	bbl.	— @	6.12½
Pigmentar	gal.	.16 @	.21
Tar Retort, 50 gal.	bbl.	13.50 @	15.00
Solvents			
Acetone, pure	lb.	.11 @	.12
Alcohol denatured, No. 1 bbls.	gal.	.40 @	.44
Benzol, 90%	gal.	.21 @	.23
Carbon bisulphide	lb.	.05½@	.06¼
Carbon tetrachloride	lb.	.06¼@	.07
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.35 @	.40
Rub-Sol (f.o.b .Okla.)	gal.	.09 @	—
Turpentine, spirits	gal.	.44 @	.46½
wood	gal.	.39 @	.44
destructively distilled	gal.	.34 @	.35
Waxes			
Beeswax, white	lb.	.51 @	.53
Carnauba	lb.	.30 @	.34
Ceresin, white	lb.	.10 @	.11
Montan, crude	lb.	.06½@	.07
Ozokerite, black	lb.	.24 @	.25
green	lb.	.26 @	.30
Paraffin (c. l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02½@	—
White crude scale 124/126	lb.	.02¾@	—
Refined, 125/127	lb.	.03¾@	—
Refined, 128/130	lb.	.03¾@	—
Refined, 135/137	lb.	.05¼@	—
Refined, 138/140	lb.	.07¼@	—

ANTI-OXIDANTS

Agerite, Resin	lb.		
Powder	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Neozone	lb.		
Oxynone	lb.	.68 @	.80
Resistox	lb.	.54 @	.57
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.66

SPECIALTIES

Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.30
Tonox	lb.	.56 @	.60

SUBSTITUTES

Black	lb.	.08 @	.14
White	lb.	.10 @	.16
Brown	lb.	.08 @	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40 @	2.75
Commercial (bags)	cwt.	1.75 @	2.10
Vandex	lb.		

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

WITH regard to inventories of finished products, the domestic tire manufacturing industry is in the best position it has experienced since November, 1928. For the rubber industry as a whole, the Department of Commerce reports manufactured stocks on July 31 as 152 per cent of the 1923-1925 average, comparing with 156 per cent on June 30 and with 175 per cent on July 31, 1929.

The Federal Reserve Board percentages of industrial production, based on the 1923-1925 average, show the steady decline in the tire and tube factories from a high of 162 in June, 1929, to a low of 80 last December, rising to the 1930 high of 123 in April, and dropping slowly to 121 in May, 119 in June, and 93 in July. The rate of rubber industry manufacturing operations, based on consumption of electrical energy for power purposes, shows July at only 103.8 per cent. of the 1923-1925 base, the lowest figure for any month since December, 1927. From the Department of Labor statistics, we learn that June rubber factory employment was 88 per cent of the same base, as compared with 88.3 per cent in May and with 115 per cent in June, 1929.

Rubber invoiced to the United States in the week ended September 6 was the highest for any similar period in six months. British warehouse stocks jumped from 110,400 tons on August 30 to 114,039 tons on September 13.

Latest figures covering imports and exports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

	Gross Imports			Re-exports			Net Imports
YEARS	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons
1921	185,394	78,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,823	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,066	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.68	17,671	23,470,583	56.77	395,667
1927	426,258	339,374,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,788	19.15	36,485	16,868,733	20.64	523,599
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,835	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,658	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,778,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	60,804	30,380,905	17.98	4,218	2,094,087	22.16	46,586
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,336	1,349,690	21.24	48,825
June	41,663	18,799,307	20.14	3,152	1,476,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.78	40,520
Aug.	37,222	16,530,990	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.70	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,605	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,998	12,215,848	13.79	3,125	1,027,136	14.67	36,868
July	35,182	10,553,944	13.39	2,732	736,863	12.04	32,450
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1923	1924	1925	1926	1927	1928	1929	1930
Jan.	30,106	29,058	29,638	32,196	31,518	34,403	43,002	36,669
Feb.	30,149	25,736	29,761	31,136	30,137	33,702	41,594	32,726
Mar.	36,629	28,385	33,495	32,936	36,141	35,688	44,730	35,914
Apr.	29,085	27,129	34,139	32,696	35,871	32,772	47,521	40,207
May	36,155	25,845	35,822	29,364	34,592	37,333	49,233	39,902
June	24,272	22,753	35,822	28,598	33,801	37,676	43,227	34,463
July	17,685	23,396	36,053	27,577	29,219	37,407	41,526	29,245
Aug.	20,359	28,982	35,909	34,533	33,460	42,927	38,274	30,575
Sept.	17,594	31,497	31,691	32,904	27,214	39,882	34,707	
Oct.	21,321	31,520	29,047	29,836	26,790	40,857	34,800	
Nov.	20,437	27,289	28,853	28,080	26,792	37,461	27,659	
Dec.	31,902	27,199	28,748	26,293	25,492	31,232	23,531	
Totals	305,694	328,769	388,481	366,149	371,027	441,340	469,804	

Figures on Quarterly Basis

Quarter	1923	1924	1925	1926	1927	1928	1929	1930
Jan./Mar.	96,776	87,609	95,263	94,301	99,216	103,558	128,565	101,610
Apr./June	89,493	75,674	104,099	87,109	103,242	103,500	139,292	112,092
July/Sept.	55,621	83,813	99,493	93,793	89,210	117,573	113,746	
Oct./Dec.	63,617	92,656	85,789	83,212	80,860	117,597	84,872	
Totals	305,507	339,752	384,644	358,415	372,528	442,227	466,475	

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

Rubber Invoiced to the U. S.

(Reported by American Consuls—Quantities in Long Tons)

During the Week Ended	From Br. Malaya	From Ceylon	From Dutch East Indies	From London & Liverpool	Total
June 28	6,732	710	921	10	8,373
July 5	5,878	724	1,772	—	8,374
July 12	6,594	315	1,537	6	8,452
July 19	4,898	270	1,317	22	6,507
July 26	5,495	435	1,521	—	7,451
August 2	6,531	914	996	7	8,448
August 9	5,397	914	1,939	—	8,250
August 16	6,177	820	1,810	25	8,832
August 23	7,498	488	1,503	—	9,489
August 30	5,796	1,043	1,662	—	8,501
September 6	8,963	1,607	1,724	—	12,294
September 13	5,879	1,177	2,001	20	9,077

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—New York Market, in Cents per Pound

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave
1928																																
April	—	27¼	27½	21½	21¼	—	—	—	20	18⅝	18½	18⅜	18¾	18⅝	—	17¾	17¼	17½	17⅝	17⅝	17⅝	—	17	17	17⅝	17⅝	17⅝	17⅝	—	17⅝	—	19
May	—	17½	17⅝	18⅛	19⅛	19⅛	—	18⅝	18⅝	19⅛	18⅞	18⅞	19⅛	19⅜	19⅜	19	19	19⅛	18⅝	18⅝	18⅝	—	19⅛	19⅝	19⅝	19⅝	20¼	20¼	20	—	—	19⅝	19½
June	—	19¼	19¾	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19	19¼	19⅝	19⅝
July	—	18¾	18⅞	—	19	19	19⅝	18⅝	—	19¼	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19	19	19	19	—	19½
August	19½	19½	19¾	19⅝	19⅝	19⅝	19⅝	19⅝	20	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19	19½
September	—	—	—	18⅞	18⅞	18⅞	18⅞	18⅞	—	17⅞	18⅛	18½	18½	18½	—	19⅛	19⅛	19⅛	19⅛	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
October	18⅝	18½	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	—	—	18¼	18¼	18	17⅞	17⅞	—	18	18	18	18	18	18	18	18	18	17⅞	17⅞	17⅞	17⅞	18⅛
November	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18	18	18	18	18	18	—	18	18	18	18	18	18	18	18	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	18⅛
December	17¾	—	17⅝	17⅝	17⅝	18⅛	18	18	—	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	18⅛	18⅛
1929																																
January	—	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅝	20	20	20	20	20	20	20	20¼	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
February	—	22	—	21⅞	22¼	22¼	22⅜	22⅜	22⅜	22⅜	22¼	22⅜	22⅜	22⅜	22⅜	22⅜	22⅜	25¼	25¼	25¼	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾
March	22⅝	22	—	21⅞	22¼	22¼	22⅜	22⅜	22⅜	22⅜	22¼	22⅜	22⅜	22⅜	22⅜	22⅜	22⅜	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾
April	26	26	26	26	26	26	25⅝	25½	25½	25¼	25¼	25¼	25¼	25¼	25¼	25¼	25¼	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾	24¾
May	23¼	22¼	22¼	22⅝	22½	22⅜	22⅜	22⅜	22½	22⅜	22⅜	22⅜	22⅜	22⅜	22⅜	22⅜	22⅜	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
June	19⅝	19⅝	19⅝	19⅝	19⅝	20¼	20¼	21⅛	21⅛	21	21	21	21	21	21	21	21	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞	20⅞
July	21¼	21¼	21⅜	21⅜	21¼	21¼	21¼	21⅛	21½	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Aug.	20¾	21	21	21	21	21	21	21	21	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Sept.	21⅜	—	21	21	21	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Oct.	—	19¾	19½	19¾	19¾	19¾	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Nov.	—	19¾	17½	17½	17½	17½	17⅝	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾	16¾
Dec.	—	17¾	—	17¾	17¾	18⅛	18	—	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17⅞	17⅞	17⅞	17⅞	17⅞	18⅛	18
1930																																
January	—	15¾	—	15⅝	15⅝	15⅝	—	—	—	15⅝	15⅝	15⅝	15⅝	15⅝	15	14⅞	14½	14½	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	15¼	15¼	15¼	15¼
February	—	15¼	15	15	15	15	16⅝	16⅝	15⅝	15⅝	16	16	15	15¼	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	14⅝	15¼	15¼	15¼	15½
March	—	15⅝	—	15⅜	15⅜	15¼	15⅜	15⅜	15⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	16⅜	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
April	—	16½	16½	15⅝	15¼	15¼	—	—	—	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	15¼	14¾	14¾	14¾	15⅝	15⅝
May	14⅜	14⅜	14⅜	14¼	14¼	13⅞	13⅞	13⅞	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	14⅜	—	14½
June	—	13¾	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	—	13⅞
July	12¼	12¼	12	—	10½	10½	10½	10¼	10¼	—	10	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	9¾	10½	—	10
August	10⅜	10⅜	—	9⅞	9⅞	9	8½	—	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝
September	—	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞	9⅞

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.80
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents
Jan.	18.62	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.98
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96
Sept.	14.44	28.95	27.56	83.88	41.00	33.67	18.47	20.37	—
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	—
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	—
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	—
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	—	6⅛	5⅛	—	17	6⅛	6½	—	4⅛
2	6⅝	6⅛	5⅛	4¾	18	6	5⅝	4¾	4⅛
3	6⅝	6⅛	—	4⅝	19	6	5⅝	4¾	—
4	6⅝	6⅛	5¼	4½	20	6	—	4¾	—
5	6⅜	6⅛	5	4½	21	6	5⅜	4⅞	—
6	6⅜	—	5	4⅛	22	—	5⅜	4¾	—
7	—	6⅛	5	—	23	5⅞	5⅜	4¾	—
8	—	6	5	4	24	6⅛	5½	—	—
9	—	5⅞	5	4⅛	25	6⅛	5⅝	4¾	—
10	6⅛	5⅞	—	4	26	6⅛	5⅝	4¾	—
11	6⅛	5⅞	4⅞	4⅛	27	6⅛	—	4¾	—
12	6⅛	5¾	4¾	4⅛	28	6¼	5¼	4¾	—
13	6¼	—	4¾	4	29	—	5¼	4¾	—
14	6⅛	5⅝	4⅞	—	30	6¼	5¼	—	—
15	—	5⅝	5	4	31	—	5¼	—	—
16	6⅛	5½	4⅞	4⅛					

Average Monthly Price Per Pound

Month	1928 Pence	1929 Pence	1930 Pence	Month	1928 Pence	1929 Pence	1930 Pence
Jan.	19.310	9.942	7.471	Aug.	9.300	10.505	4.880
Feb.	15.713	11.875	7.948	Sept.	8.530	10.160	—
Mar.	12.736	12.135	7.595	Oct.	8.807	9.620	—
Apr.	8.564	10.490	7.391	Nov.	8.596	8.442	—
May	8.845	10.717	6.926	Dec.	8.570	7.958	—
June	9.293	10.580	6.195	Average			
July	9.312	11.065	5.648	for Year	10.656	10.291	—

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.	Day of Month	Aug.	Sept.
1	12.80	—	11	12.55	11.30	21	11.15	—
2	12.85	11.30	12	12.35	11.05	22	11.15	—
3	—	11.40	13	12.40	11.00	23	11.25	—
4	13.10	11.45	14	12.05	—	24	—	—
5	12.85	11.65	15	11.90	11.05	25	11.45	—
6	12.95	11.65	16	11.60	10.95	26	11.75	—
7	13.15	—	17	—	11.00	27	11.70	—
8	12.55	11.25	18	11.00	11.00	28	11.70	—
9	12.60	11.20	19	11.25	—	29	11.40	—
10	—	11.50	20	11.35	—	30	—	—
						31	—	—

Average Monthly Price Per Pound

Month	1928 Cents	1929 Cents	1930 Cents	Month	1928 Cents	1929 Cents	1930 Cents
Jan.	19.12	20.22	17.21	Aug.	19.28	18.62	12.03
Feb.	18.40	20.21	15.62	Sept.	18.67	18.83	—
Mar.	19.38	20.19	15.13	Oct.	19.62	18.46	—
Apr.	20.63	20.29	16.39	Nov.	19.84	17.53	—
May	21.58	19.41	16.43	Dec.	20.22	17.28	—
June	21.50	18.74	14.48	Average			
July	21.36	18.62	13.10	for Year	19.97	19.03	—

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1928	ON HAND 1929	ON HAND 1930	AFLOAT 1928	AFLOAT 1929	AFLOAT 1930	ON HAND AND AFLOAT 1928	ON HAND AND AFLOAT 1929	ON HAND AND AFLOAT 1930
Jan.	110,244	76,842	126,068	46,441	93,330	65,483	156,685	169,672	191,551
Feb.	108,955	90,068	134,790	48,044	75,790	71,015	156,999	165,848	205,805
Mar.	114,061	100,536	141,843	43,378	67,065	63,646	157,439	167,601	205,489
Apr.	118,083	107,659	148,272	32,783	65,798	63,261	145,866	173,457	211,533
May	105,356	97,192	146,179	33,145	65,793	68,168	138,501	162,985	214,347
June	90,193	92,061	151,485	38,392	54,668	58,657	128,590	146,729	210,142
July	88,242	92,535	152,001	42,943	48,145	58,326	126,185	138,680	210,327
Aug.	68,994	90,769	158,178	54,904	49,423	61,168	123,898	140,192	219,346
Sept.	68,851	84,362		52,692	58,758		121,543	143,120	
Oct.	66,421	88,483		45,646	59,180		112,067	147,663	
Nov.	61,956	92,219		75,502	62,358		137,458	154,577	
Dec.	66,166	118,609		92,037	62,388		158,203	180,997	

(Rubber Manufacturers' Association figures raised to 100%.)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1928	1929	1930	At end of	1928	1929	1930
Jan.	66,524	25,191	60,434	July	35,429	30,080	81,048
Feb.	62,964	25,554	64,557	Aug.	32,084	35,605	
Mar.	58,272	28,214	68,923	Sept.	31,440	42,188	
Apr.	53,425	31,368	74,676	Oct.	24,207	47,803	
May	44,628	31,290	77,312	Nov.	17,775	52,454	
June	38,756	31,025	80,260	Dec.	19,815	54,304	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1930					
April	71,477	72,233	73,252	74,084	
May	75,540	76,118	76,932	76,953	77,198
June	77,616	78,104	78,888	79,699	
July	80,060	80,501	80,814	80,845	
August	80,379	80,044	80,224	80,618	80,611
September	81,880	82,233			

Stocks in Liverpool

1930					
April	22,008	22,676	22,663	23,546	
May	23,877	23,755	24,448	24,722	25,526
June	25,320	26,646	27,354	27,493	
July	28,143	28,226	28,126	28,381	
August	28,404	28,660	29,048	29,673	29,789
September	31,159	31,796			

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1928	1929	1930	End of	1928	1929	1930
Jan.	25,868	29,617	39,727	July	18,663	33,859	45,459
Feb.	22,867	32,373	44,371	Aug.	18,971	30,834	48,132
Mar.	20,538	29,437	45,657	Sept.	14,898	32,138	—
Apr.	16,946	26,474	48,473	Oct.	12,149	33,770	—
May	17,437	30,764	44,715	Nov.	29,188	30,963	—
June	18,207	30,403	42,451	Dec.	32,895	35,548	—

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe[1]	Holland	Colombo	Para and Manaos
Jan.	44,740	28,440	2,124	5,400	3,668
Feb.	41,955	28,180	2,159	5,000	4,370
Mar.	39,206	27,510	2,220	4,759	4,578
Apr.	39,758	23,580	2,204	4,000	4,482
May	26,482	22,730	2,308	4,000	4,388
June	26,578	16,095		3,856	4,588

(1) Reported by U. S. Department of Commerce.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1926	24,199,524	78.8
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1930			1930		
January	1,601,326	84.0	July	1,449,161	80.7
February	1,653,421	78.9	August	1,504,187	78.1
March	2,061,999	79.1	September		
April	2,339,834	81.1	October		
May	2,010,067	84.3	November		
June	1,333,226	83.5	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944	73,308
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296	74,021
Inventory[2]	6,132	5,772	7,427	8,142	10,456	10,264	13,624	12,627

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,358	6,722	4,745	5,394	6,626	4,701	9,949	13,712	12,719
Feb.	6,363	6,912	4,859	5,031	5,282	4,474	11,721	15,495	13,238
Mar.	6,819	7,519	5,188	5,731	6,708	5,032	12,389	16,351	13,469
Apr.	6,178	7,384	6,024	5,812	7,294	5,429	12,717	16,929	13,948
May	6,759	8,145	6,099	6,457	7,184	5,564	13,024	17,849	14,327
June	6,692	7,304	5,464	7,117	7,254	5,647	12,162	17,957	14,163
July	6,498	6,475	4,257	7,895	7,855	5,810	11,157	15,830	12,599
Aug.	7,469	5,806	—	8,403	7,845	—	10,034	14,226	—
Sept.	6,802	4,758	—	7,145	5,993	—	9,765	12,875	—
Oct.	7,326	4,919	—	5,717	4,960	—	11,520	12,845	—
Nov.	6,075	3,603	—	4,998	3,558	—	12,579	12,935	—
Dec.	5,605	3,261	—	4,591	3,346	—	13,624	12,627	—

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	50,850	60,116	70,706	82,614	76,613	70,823	80,180	73,417
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127	75,298
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117	13,660

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,441	6,517	4,914	6,072	7,242	5,181	12,982	15,356	13,551
Feb.	6,895	6,769	4,943	5,431	5,278	4,627	14,650	16,999	13,905
Mar.	6,231	7,466	5,271	5,731	6,737	5,042	15,573	17,750	14,057
Apr.	6,661	7,634	5,877	5,702	7,164	5,172	16,638	18,134	14,704
May	7,168	7,660	5,904	6,300	7,038	5,412	17,702	18,928	14,775
June	6,953	6,978	5,280	7,136	6,950	5,616	17,159	17,741	14,518
July	6,674	6,178	4,201	8,729	8,113	6,246	14,974	16,332	12,434
Aug.	8,343	5,846	—	9,350	8,183	—	13,931	14,157	—
Sept.	7,103	5,536	—	7,154	6,250	—	13,543	13,424	—
Oct.	6,929	5,310	—	5,662	5,001	—	15,285	13,656	—
Nov.	5,592	3,780	—	5,002	3,712	—	15,743	13,701	—
Dec.	5,184	3,716	—	4,858	3,631	—	16,117	13,660	—

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,293,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	25,584	5,703	497,371
March	584,733	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,137	2,287	226,994
Dec.	119,950	92,717	27,233	5,495	4,426	1,069	125,445
TOTAL	5,358,361	4,603,609	754,752	263,295	207,498	55,797	5,621,656
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	323,962	276,833	47,129	15,548	13,021	2,527	339,510
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.							
Sept.							
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]								DUTCH EAST INDIES[1]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[5]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,523
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1928:															
May	26,483	10,350	16,133	3,091	654	842	494	241	4,943	5,855	10,347	717	2,602	1,135	45,994
June	22,994	16,168	6,826	3,107	963	926	494	451	5,419	5,863	13,655	725	1,399	960	40,788
July	30,481	13,383	17,098	5,129	1,043	995	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,073
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,533	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	48,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	1,059	1,922	733	67,233
June	40,398	14,344	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	757	1,398	548	61,017
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	575	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	451	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,993	884	832	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,653	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	600*	386	5,709	7,831	8,920	856	1,837	585	77,578*
Feb.	48,947	12,960	35,987	7,825	1,245	847	600*	469	6,900	7,191	11,414	944	1,797	480	75,699*
Mar.	47,320	13,236	34,084	6,269	1,129	976	600*	391	5,796	6,612	11,070	643	1,674	536	69,780*
Apr.	45,517	16,331	29,186	5,030	856	1,026	600*	366	4,802	6,326	12,582	433	1,201	630	63,038*
May	49,388	36,135	13,253	5,947	975	917	600*	350	6,352	6,661	11,916	753	1,383	555	49,662*
June	36,657	12,120	24,537	4,152	778	1,040	600*	392	4,728	4,776	9,512	425	974	551	52,465*
July	41,347	12,754	28,588	4,619											

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included— such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (ed)	Belgium (d)	Netherlands	Scandinavia (abedf)	Spain (g)	Czechoslovakia (abed)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,128	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	3,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	-3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,459	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	-11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	-807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,493
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,643
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,881	12,018	9,490	5,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,483	15,134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1929	526,709	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	892,739
1928:															
May	28,660	—5,822	3,297	2,944	2,180	2,288	1,090	3,893	655	746	209	485	220	213	41,558
June	25,143	—3,031	3,597	2,968	2,186	2,102	984	4,111	348	743	133	346	251	182	40,668
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	284	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	786	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	81	557	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	485	263	200	65,908
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,831	5,179	5,001	4,613	2,998	2,727	1,259	684	1,131	627	113	226	115	356	86,270
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,224
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	420	65,787
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	68,201
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	1,234	724	902	254	429	25	319	69,865
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	1,235	853	672	253	361	91	477	68,346
Oct.	35,840	16,111	4,489	3,355	1,821	3,902	1,838	1,073	1,125	1,147	278	710	91	201	71,981
Nov.	40,972	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	361	253	595	62	313	72,439
Dec.	40,488	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,609
1930:															
Jan.	44,759	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,799
Feb.	40,718	10,293	4,482	3,697	2,250	1,386	1,385	2,705	457	1,143	188	315	200*	239	69,458
Mar.	42,068	12,346	4,354	4,289	3,776	2,663	1,083	168	975	678	358	322	200*	263	73,543
Apr.	42,961	13,058	4,962	4,488	2,303	2,769	2,067	949	673	1,431	158	461	200*	255	76,735
May	40,287	9,861	5,276	4,379	2,593	2,699	1,279	1,689	64	1,250	230	274	200*	346	70,427
June	37,257	9,645		3,794	2,579		1,378		67	691	343	507			
July		7,650		3,395			197								

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation; such imports amount to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 1,231 tons in 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics Yards	Rubber Heels Pairs	Rubber Soles Pairs	Mechanical Goods Shipments Dollars
1924	25,920,000	186,279,000	(1)	$45,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,277,000
1926	29,328,000	183,312,000	12,258,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	85,235,000
1928	41,179,000	235,170,000	37,645,000	89,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1928:				
August	5,085,000	23,095,000	2,943,000	6,792,000
September	5,507,000	21,702,000	2,841,000	5,306,000
October	6,116,000	22,386,000	3,502,000	5,887,000
November	4,395,000	17,863,000	3,400,000	4,932,000
December	2,291,000	14,781,000	3,003,000	4,751,000
1930:				
January	3,281,000	15,470,000	3,496,000	5,169,000
February	3,441,000	14,172,000	2,338,000	5,376,000
March	3,570,000	15,439,000	2,582,000	5,981,000
April	4,029,000	17,762,000	2,593,000	5,989,000
May	3,775,000	15,603,000	1,939,000	6,183,000
June				5,318,000

(1) Not available; (2) Last 9 months only.
Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	987,038	8,332	2,213,964	2,900	1,068,698
1920	758	845,955	1,064	1,260,045	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,898	985	333,564
1922	127	57,040	812	978,765	2,385	403,812	818	281,012
1923	1,155	542,227	700	896,524	4,565	853,308	912	376,167
1924	1,256	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	854	827,218	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
1929	1,231	545,175	728	566,964	8,203	2,458,126	447	167,479
1929:								
Aug	190	80,443	58	47,769	575	171,733	—	—
Sept.	107	51,156	38	30,827	918	279,225	—	—
Oct.	200	79,968	58	43,756	636	181,421	—	—
Nov.	125	47,796	13	11,600	583	182,677	49	14,935
Dec.	100	41,328	25	19,955	550	156,939	51	12,095
1930:								
Jan.	150	55,272	28	28,549	509	141,384	—	—
Feb.	75	25,956	52	45,319	367	93,087	—	—
Mar.	148	50,007	16	12,498	522	128,844	—	—
Apr.	75	19,856	58	54,548	410	103,089	—	—
May	172	57,760	17	13,645	602	144,415	—	—
June	168	51,561	52	47,000	532	120,424	45	16,649
July	93	26,000	24	17,463	45	102,325	—	—

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks*	Year	Production	Consumption Tons	Consumption % to Crude	Stocks*
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,590	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,842	Aug.	19,049	17,890	41.7	15,381
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,263	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,187	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.8	25,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,980	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	.....	.....	.....	.....
Apr.	17,828	16,904	42.0	24,587	Oct.	.....	.....	.....	.....
May	17,812	17,052	42.7	23,356	Nov.	.....	.....	.....	.....
June	15,714	14,063	40.8	24,449	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1929	1930	MONTHS	1929	1930
January	22,602,000	25,731,000	July	36,860,000	38,352,000
February	22,776,000	26,509,000	August	37,759,000	
March	28,495,000	31,029,000	September	34,193,000	
April	32,019,000	34,549,000	October	32,816,000	
May	34,117,000	36,497,000	November	31,502,000	
June	33,163,000	35,902,000	December	26,550,000	

REVIEW DESK

Books, New Publications, Catalogues, Etc.

RUBBER: AN ECONOMIC AND STATISTICAL STUDY. By Jose Carlos de Mecedo Soares. Published by Richard R. Smith, New York City. 1930. 106 pp. $3.

The French edition of this work was published in the fall of 1928 and the original Portuguese edition still earlier, but little or no attempt has been made to bring the statistics up to date and we are still faced with "estimates" of 1929 production and consumption whose fallaciousness is now historical. The treatise remains, however, as was noted in THE RUBBER AGE of November 25, 1928, "interesting as a study of the entire world rubber situation from the viewpoint of a Brazilian." One chapter discusses the rise and fall of the Stevenson Restriction Act, and another chapter, explaining the attitude of the United States on such measures, details the views of Herbert Hoover as "the principal exponent of North American opinion." After a section on the economic expansion of the United States, the author concludes that for Brazil "the order of the day must be to plant and keep on planting." The present edition was printed in Scotland and includes a short introduction by Dr. Philip Schidrowitz.

STUDIES IN THE VULCANIZATION OF RUBBER. By C. R. Boggs and John T. Blake. Reprinted from *Industrial and Engineering Chemistry*, 706 Mills Building, Washington, D. C. 1930. 22 pp. For free distribution.

The four papers in this reprint were read at the Atlanta meeting of the Rubber Division of the American Chemical Society last April. The first three by Mr. Blake are under the titles of "Thermochemistry of Vulcanization of Rubber," "Vulcanization of Rubber with Nitro Compounds" and "Kinetics of Vulcanization of Rubber With Sulfur and Selenium," while the final paper, "A Theory of Vulcanization of Rubber," is the result of a collaboration between Mr. Blake and Mr. Boggs.

THE TIME STUDY DEPARTMENT: Its Place in the Factory Organization. By A. L. Kress. Published by the American Management Association, 20 Vesey Street, New York City. 1930. 16 pp. $.75.

In the opinion of the author, the time study department should have complete responsibility for the setting of all rates in a plant where a wage incentive plan is in use, while the head of the department should be a capable industrial engineer, with a staff status comparable to that of the mechanical engineer, for example, and should report only to the highest ranking production executive. Mr. Kress, who is head of the central planning department of the United States Rubber Company, read this paper at a production executives' conference at Pittsburgh last year, and the discussion that followed it is also included.

PRACTICAL SALES PROMOTION PLANS. Published by the Oak bber Company, Ravenna, O. 1930. 16 pp. For free distribution.

By pleasing a child, this booklet argues, you create able good will in the minds of parents. On this premise is ba. use of toy balloons for a sales appeal. Various methods ploying these rubber toys are described, including their use as a f radio and publication appeal, and the correct practices in g and tieing balloons are explained.

SPONGE RUBBER MANUFACTURE BY THE USE OF SPONGE PASTE. Published by the C. P. Hall Company, Akron, O. 1930. 4 pp. For free distribution.

Sponge Paste, as described in THE RUBBER AGE of July 25, 1930, is a cream white, oily paste ingredient for making sponge rubber and is a compound of the four essentials—softener, blowing agent, accelerator and anti-oxidant. The base formula and production procedure are presented in this brochure, together with several suggestions for use in making sponge rubber.

EYES SAVED IN INDUSTRY. Published by the National Society for the Prevention of Blindness, 370 Seventh Avenue, New York City. 1930. 24 pp. $.15.

How more than 10,000 eyes and at least $46,000,000 were saved in two recent years by the use of goggles or headmasks in 583 plants is told in this study, made jointly with the National Safety Council. Only 8 of the 4,654 cases actually reported were in the "rubber, batteries and allied industries."